# Coal Age

SEPTEMBER, 1955
A McGRAW-HILL PUBLICATION -PRICE 50c

•	Coal	N	Aa	kes	Oil
	Coal		Adl	VC2	

World's first commercial plant now a reality . . . p 54

### Mine Injuries Down 50%

Statewide drive rings bell in Indiana . . . p 58

#### Belt Mine Gets 18 TPM

High efficiency, total cleaning builds markets . . . p 62

#### Bosses Learn Maintenance

Mine training proves four-way benefit . . . p 68

#### Prize Cattle Thrive

Grazing profitable on stripped land . . . p 74



### These M·S·A instruments

keep you on guard against

# METHAND



#### M.S.A. METHANE DETECTOR TYPE W-8

Portable, accurate instrument for measuring methane content of mine air at working face, break-throughs, air courses, and other points in mine where methane may accumulate. Operator simply squeezes rubber hand-bulb a few times, draws in air sample, and amount of methane is indicated on easy-to-read dial in less than 30 seconds. Two scale ranges—for greater reading accuracy—0 to 2% and 0 to 5%. U. S. Bureau of Mines Approved. Write for bulletin.



Streamlined, pocket sized unit, indicates methane concentrations as low as .2% in mine air. Pump is operated with the fingers while tester is held in palm of the hand. Edison Electric Cap Lamp battery provides dependable power. Unit connects and disconnects quickly from battery. U. S. Bureau of Mines Approved. Write for bulletin.



#### and for Continuous checks on Methane Concentrations

#### AT THE WORKING FACE

#### M.S.A. METHANE ALARM

This unit provides continuous sampling and automatic warning of hazardous methane concentrations during entire working shift. Sampled air that exceeds pre-determined safe limit sets off unit, and a flashing red light alerts miners. Portable, or available with shock mounting assembly for use on machinery. Edison R-4 Battery supplies power. Write for complete details.





#### IN RETURN AIR SYSTEMS

#### M.S.A. METHANE RECORDER

Continuously charts methane concentrations in return air. This unit provides an accurate safety check against unusual gas conditions, and serves as a guide for regulating volume of air needed to maintain proper and economical ventilation standards. In addition to recording

methane, this unit can be designed to give visual and audible warnings of increasing or dangerous conditions. Write for details.



# SAFETY EQUIPMENT HEADQUARTERS

When you have a safety problem, M.S.A. is at your service.

Our job is to help you.

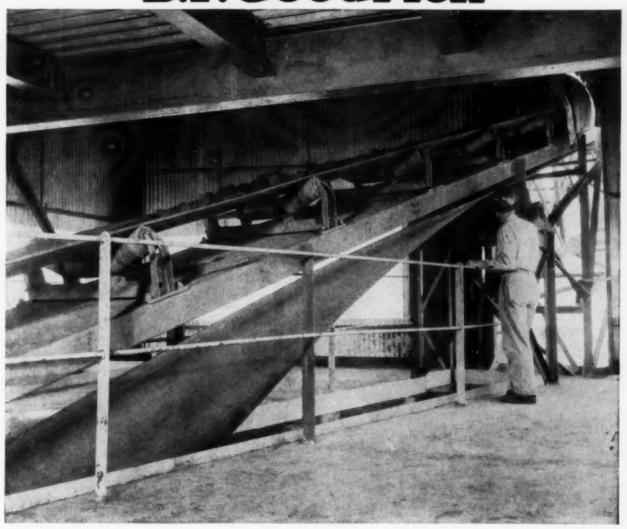
#### MINE SAFETY APPLIANCES COMPANY

201 North Breddock Avenue, Pittsburgh 8, Pa. At Your Service: 76 Branch Offices in the United States

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#### RESEARCH KEEPS B.F. Goodrich FIRST IN RUBBER



# How conveyors stay clean even when load is sticky

That stuff riding the conveyor belt is refuse from a coal washing plant on its way to a dumping point—550 feet uphill. When plans were drawn up, engineers said the usual conveyor system wouldn't be the answer here. They knew the wet clay and sticky sand would cling to the belt, build up into gummy layers, clog the return idlers and pulleys, and damage the belt cover.

To avoid this trouble, they installed something quite different in conveyors—the B. F. Goodrich "Turnover" belt system. Here's how it works. As the material is dumped off the end of the moving belt, the belt makes a 180° turn, runs empty along the return idlers, then

makes another one-half turn (as shown above) before receiving the next load.

Only the clean side of the belt touches the idlers, so there's no chance for sticky materials to build up on them. Even wet materials can be handled in cold weather without danger of the belt freezing to the rotating metal parts.

With the "Turnover" belt, expensive

With the "Turnover" belt, expensive decking can be eliminated. Clean up of spillage is no problem because any material that falls on the lower run of the belt is carried to the end and dumped off when the belt makes its turn. Damage to belt body is reduced because lumps of materials cannot be trapped between the belt and pulleys.

If you have an operation where sticky, freezing or corrosive materials must be moved from place to place, the B. F. Goodrich "Turnover" conveyor system can save you trouble and money. Your B. F. Goodrich distributor can give you full details and show you how easy it is to convert any conventional system into the turnover type. The B. F. Goodrich Company, Dept. M-468, Akron 18, Ohio.

# B.F. Goodrich INDUSTRIAL PRODUCTS DIVISION

## Even the fastest jockey



It took each Giant 4 days to earn \$11,148 per man in the 1954 Series. But Eddie Arcaro, famous jockey, collected \$11,216 for 2 races at Belmont Park, working a total time of  $3\frac{3}{4}$  minutes, in one day.

HULBURT OIL & GREASE COMPANY

PHILADELPHIA, PA.

Specialists in Coal Mine Lubrication

### can't beat FRICTION!



# Hulburr

# QUALITY LUBRICANID

Jockeys earn big money by working fast for a few minutes . . . . but FRICTION costs BIGGER money by slowing down and STOPPING the work of mining machines. You can't whip or "jockey" a friction-bound machine into profitable production. You've got to use the right kind of lubri-

cants....meaning HULBURT QUAL-ITY LUBRICANTS.... for fast going under the handicap of tough mining conditions. Odds are that the most efficient mining operators you know are confirmed HULBURT users. Wanna bet?

# YOUR FINE COAL GETS THOROUGHLY DEWATERED

YOU USE ONLY 0.4 HP PER TON

YOU RUN THE SCREEN FOR WEEKS INSTEAD OF DAYS . . . five to ten times longer than you would expect of a fine coal screen

YOU GET ALL THE COAL . . . filtrate loss is negligible throughout the long life of the screen

YOUR COAL IS DELIVERED
WITH ALMOST NO DEGRADATION



- when you install
The BIRD-HUMBOLDT
CENTRIFUGAL DRYER

For Bulletin containing detailed description of this wonderful, new fine coal drying unit write BIRD MACHINE COMPANY
SOUTH WALPOLE · MASSACHUSETTS
REGIONAL OFFICES: EVANSTON, ILLINOIS · PORTLAND, OREGON



#### MINING GUIDEBOOK NOW ON THE PRESS!

ON THE WAY TO SUBSCRIBERS within the next 2 wk, the 1955 Coal Age Mining Guidebook and Buying Directory Issue is a new, additional service coming to you as a part of your regular Coal Age subscription.

The Mining Guidebook has been prepared to fill a long-felt need of every progressive operating official—the need for up-to-the-minute, fundamental information on every phase of coal mining, in one place and under one cover. As you no doubt know from your own experience, this will be the first time that such a comprehensive, complete Guidebook to modern operating principles has been made available to the industry.

Basically, the Coal Age Guidebook

Basically, the Coal Age Guidebook will analyze the major present-day problems of mine operation, discuss what is being done to cut costs and raise efficiency on each, tell why it's being done and how it is being accomplished. The main editorial section of over 100 pages will be divided into six major groupings, each a complete Guidebook in itself, as follows:

Deep Mining Strip Mining Preparation Maintenance Supply Service

Plus a Buying Directory of equipment, services and materials generally used by the industry, with manufacturers classified by products offered so to simplify your locating sources of

supply.

We've planned the 1955 Guidebook as a practical, useful workbook you'll want to keep within reach for ready reference whenever operating problems require study or buying information is needed. We hope you find it helpful.

COAL AGE VOLUME 60 SEPTEMBER, 1955

(with which are combined The Colliery Engineer and Mines and Minerals)

Published monthly on the 1st, with an additional issue in Mid-September, by McGraw-Hill Publishing Company, Inc., James H. McGraw (1860-1948), Founder. Member ABC and ABP.

Memor ABC and ABP.

Executive, Editorial and Advertising Offices: McGraw-Hill Bailding, 339 W. 42nd 81. New York 36, N. Y.

Publication Office, 1309 Noble 8t., New York 36, N. Y.

Donald C. McGraw, President; Paul Montgomery, Executive Vice President; Joseph A. Gerardi, Vice President, Bond, Executive Vice President, Publications Division;

Rajoh B. Smith, Vice President and Editorial Director;

Joseph E. Allen, Vice President and Director of Adventions, J.

Blackburn 3r., Vice President and Circuitation Director.

Subscription: Address all correspondence to COAL AGE —Subscription Service, 330 W. 42nd St., New York 36, N. Y.

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Member of Associated Business Publications and Audit Bureau of Circulations

Allow I month for change of address. Subscriptions are solicited only from management, production and maintenance executives and engineers in the coal-mining industry. Position and company connection must be indicated on subscription orders.

Single Copies: U. S. and possessions and Canada, 50c; all other countries, \$1.50.

Subscription rates: United States and possessions and Canada, \$3 for one year, \$4 for two years, \$5 for three years. Other Western Hemisphere and the Philippines, \$10 for one year, \$16 for two years, \$20 for three years. All other countries, \$15 for one year, \$25 for two years, \$30 for three years,

Featured as second class matter May 4, 1951, at the Post Office, Philadelphia, Pa., under the Act of March 5, 1879. Printed in U.S.A. Contents Copyright 1955 by McGraw-Hill Publishing Co., Inc.—All rights reserved. COAL AGE articles are indexed regularly by Engineering Index, Inc. COAL AGE's own index is published annually in December.

punimed annually in December,

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on television...
Saturday nights, NBC.



# HOW CRATER KEEPS WIRE ROPE STRONG LONGER---

WHEREVER wire rope is lubricated and protected by *Texaco Crater*, it stays strong longer. Here's convincing proof from a user in Kentucky (name on request):

"We have a 3,100-foot Bethlehem wire rope used to lower loaded coal cars from an upper seam to a level where they can be pulled by locomotive to the tipple. Four cars weighing  $8\frac{1}{2}$  tons, and containing about three and a half tons each, are handled at a time. The rope has been lubricated exclusively with Texaco Crater—conveniently sprayed on when the hoist is in operation.

"After some two years' service and over 225,000 tons of coal had been lowered, we sent a sample of the rope to the manufacturer for testing. The report on the test showed the rope to be perfectly lubricated and to have more tensile strength than guaranteed when sold to us. We shall certainly keep on using Texaco Crater."

This case is typical. Texaco Crater is the penetrating wire rope lubricant that gives long-lasting protection to both strands and core. It is also ideal for open gears, assuring smoother operation, longer gear life. For greater application convenience, many operators prefer Texaco Crater X Fluid. It goes on as a liquid, stays on as a tough, tenacious lubricating film.

The same mine that reported the outstanding results cited above, also uses *Texaco Olympian Grease* to lubricate mine car wheels. This superior lubricant assures easier starts in any weather... gives bearings maximum protection under all conditions...enables locomotives to haul more tonnage at lower upkeep cost.

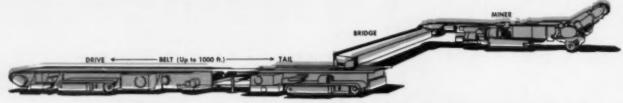
Let a Texaco Lubrication Engineer help you increase efficiency and reduce maintenance costs. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, N.Y.

**LUBRICANTS** for the Coal Mining Industry

# TONS PRODUCED PER MAN-SHIFT.





# The JOY "1-CM-EX-BELT" COMBINATION

#### points the way to increase your profit margin

Here's a mining team that can really slash your production costs, as the operating figures on the facing page adequately prove. The Joy 1-CM Continuous Miner, teamed with the Joy Extensible Belt Conveyor for continuous haulage, provides a combination that is the absolute last word in low-cost, high-production mechanized mining in seams of 52" and higher.

For lower coal, the popular 3-JCM Continuous Miner—only 34" high over-all—takes over the extracting job. And for full-face mining in seams of approximately 6 to 8 ft., the powerful Joy Twin Borer is now available for continuous production at an 8-ton-a-minute clip.

The 1-CM Miner has a capacity of 4 tons per minute, is 45" high over-all, and will cut from 5½" below floor to 90" above (120" with special equipment). It is available with two hydraulic roof drills of 4200-lb, thrust (note the photo-

graph above) making the 1-CM a fully integrated unit capable of handling both advance and roof control.

The Joy "Ex-Belt" Conveyor (see drawing above) now permits a continuous mining machine to operate almost without interruption in driving rooms and entries up as far as 1000 feet, including breakthroughs and taking pillar on retreat. It is available in 24, 30 and 36-inch widths and consists of two main units: a drive and a tail section with bridge conveyor, both self-propelled on identical crawler treads.

The "Ex-Belt" extends or retracts 50 feet while operating under full load. Belt tension and slippage are under automatic control at all times. A 100-foot length of belt can be added or removed, as needed, in an average time of only 5.3 minutes; and the entire system can be moved over and set up for a new heading in less than 2 hours.

# FIRST, went up 40%

when a JOY I-CM Continuous Miner was used instead of conventional methods

# THEN, increased 38% more

when a JOY Extensible Belt Conveyor was added to provide continuous haulage

	1 MONTH'S RUN	I-CM MINER-"EX-BELT" COMBINATION
TOTAL PRODUCTION (RAW COAL)	. 17,818 TONS	51,253 TONS
TOTAL SHIFTS WORKE OFF)	AST TONS	107 479 TONS 831 TONS
AVERAGE PRODUCTION PER SHIFT.  BEST PRODUCTION SHIFT.  WORKING CREW CHARGED TO THE  WORKING CREW SHIFT.	8/2 MEN	7 MEN
BEST PRODUCTION SHIP WORKING CREW CHARGED TO THE WORKING CREW CHARGED TO THE EQUIPMENT PER SHIFT.  AVERAGE PRODUCTION PER MAN PER SHIFT.	53.8 TONS	68.4 TONS

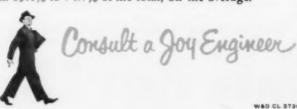
The results above cover two regular periods of operation in a West Virginia mine. The coal is in the Pittsburgh seam and averages about 8 feet in thickness. It contains numerous clay veins up to 4 feet thick, resulting in both bad top and bottom when encountered, and requiring the hauling of considerable waste material. Mining height is limited to about 7 feet, leaving some head coal for roof support, and some bottom because of impurities.

In the first operating period of a month, the Joy 1-CM Miner was teamed with two Joy 10-SC shuttle cars unloading on belt conveyors. Production per man-shift averaged 53.8 tons, an increase of 40% over conventional mining methods. Size consist also improved with 1-CM production, with the sizes over %" increasing from 69.1% to 74.7% of the total, on the average.

In the second period of nearly three months, a Joy "Ex-Belt" Conveyor replaced the shuttle cars. Production per man-shift jumped to 68.4 tons, an additional increase of 38% and a total increase of 78% over the methods previously used!

AVE BUN

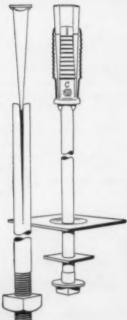
What would results like these do for your profit margin? Let us help you to secure real cost reductions under today's conditions, with rugged, field-proved equipment that is built to stay on the job. Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa. In Canada: Joy Manufacturing Company (Canada) Limited, Galt, Ontario.



WORLD'S LARGEST MANUFACTURER OF UNDERGROUND MINING EQUIPMENT



# Up Goes Production... When Roof Bolts Go In



When you equip your mine with roof bolts, production is increased because of the wider openings and clearances, and increased room in which to operate mechanized equipment. And with large, old-fashioned supports out of the way, ventilation is improved.

Roof bolts make larger work area possible, and permit a tight, sound roof, because they consolidate strata into a single-unit thick beam. Such roof control promotes safety by minimizing the possibility of serious roof falls.

#### 4 Types of Bethlehem Roof Bolts

**SLOTTED BOLT.** This husky 1 in. bolt has a centered slot which is made by forging, without any loss of metal. Other end of bolt has 5 in. of rolled threads. Bolt is used with steel wedge, which is forced deep into slot, expanding the bolt-ends, when bolt is driven in 1¼ in. hole. Bolt has truncated-cone point to prevent thread damage. Normally furnished with American Standard regular square nut.

**SQUARE-HEAD BOLTS.** Three types: a ¾ in. carbon-type, and a ¾ in. high-strength bolt, each with typical breaking load of 24,000 lb; also a ¾ in. high-strength bolt with typical breaking load of 45,000 lb. The ¾ in. and ¾ in. bolts can be used with Bethlehem's matching-halves Type F expansion shell or the 4-leaf Type C expansion shell. The ¾ in. bolt is for use with the Type F shell in 1½ in. hole.

HARDENED WASHERS. Bethlehem's hardened washer for use with headed bolts reduces the friction between bolt head and roof plate that occurs when high tension in the bolt produces excessive bearing pressure. With this washer, impact wrenches can be used freely, without galling or tearing of metal.

#### BETHLEHEM STEEL COMPANY BETHLEHEM, PA.

On the Pacific Coast Bethlebem products are sold by Bethlebem Pacific Coast Steel Corporation Export Distributor: Bethlebem Steel Export Corporation

#### BETHLEHEM STEEL





Mine operators throughout the mining industry have found TRABON automatic lubrication systems totally dependable under all operating conditions. Complete sealing enables TRABON systems to operate with equal efficiency underground or on the surface, unaffected by harmful elements.

TRABON positive systems provide the right amount of lubricant to each bearing point at the right time. It's impossible to skip a bearing since the operation of each measuring valve depends on the previous valve having operated first. A single indicator at the pump tells you when each bearing has been lubricated.

Costly equipment breakdown and bearing loss are eliminated with TRABON troublefree lubrication.

Write for our detailed literature today.

this has a **BEARING** on production







Remove Snap Ring



Remove Chuck



#### THE CLEVELAND S20 VAC-NU-MATIC STOPER

All models available in either SAV-A-CHANGE or Socket Type Chuck

The new CLEVELAND S20 VAC-NU-MATIC dust collecting stoper is available in 3 feed lengths to suit any working height down to a 26" seam. It will produce a 30" hole in a 26" seam without using coupled steel. The 28" feed weighs 69 lbs. complete. Any model may be used either hand held or jumbo mounted. VAC-NU-MATIC bits are fast and free cutting and eliminate all stuck steels. Dust collection is positive even in wet top. Chucks may be replaced without dismantling the machine, using only a pair of snap-ring pliers. Cuttings are removed at the chuck housing and do not pass through the machine. Write for bulletin RD32 or let us demonstrate in your own mine.

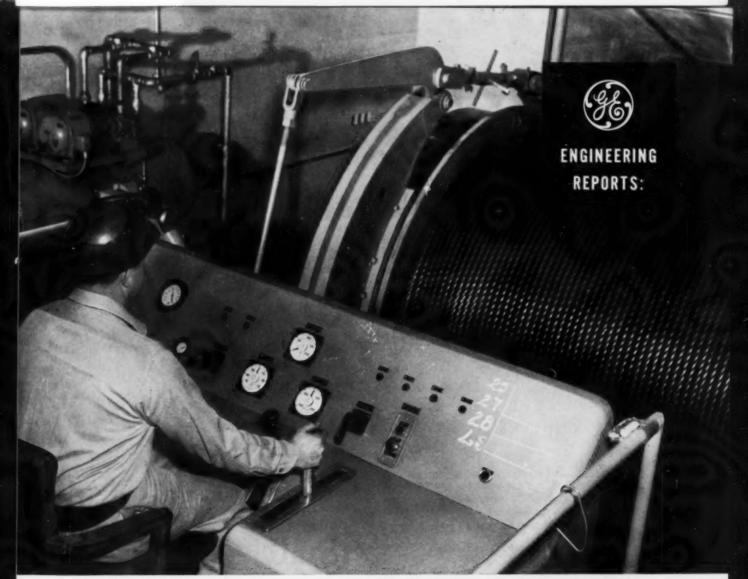
For sales, service, information or demonstration in Pennsylvania and West Virginia contact: Schroeder Brothers — 3116 Penn Ave., Pittsburgh, Pa. or Acme Machinery Co. — Williamson, W. Va. In the Birmingham district contact Equipment Service Co., 617 North 9th St., Birmingham, Ala., or contact us direct from anywhere.

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CLEVELAND ROCK DRILL DIVISION
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RB-74



CUSTOM-BUILT G-E manual or automatic mine hoist drives are available in many types for heavy-duty hoisting.

G-E electrical systems and equipment help you . . .

### Mechanize underground mining for more tonnage at lower cost

As market conditions change, underground mines must produce more, faster, and more efficiently, to improve their competitive position. Key to this objective is increased mechanization, with General Electric's help.

You benefit many ways when you specify G-E electrical systems and equipment. Advantages like these can play an important part in your mine mechanization program:

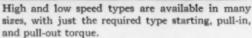
- FACTORY-ASSEMBLED G-E power-system equipment cuts installation time and cost, speeds new construction and start-up.
- SPACE-SAVING G-E electrical equipment adapts readily into existing systems, can be expanded easily, at low cost.
- LOW-MAINTENANCE G-E drives are designed to last longer, provide more horsepower in limited space, with maximum accessibility for servicing.

TURN PAGE FOR MORE PRODUCT INFORMATION





HIGH EFFICIENCY AND POWER FACTOR of General Electric synchronous conveyor or compressor motors cut electrical losses, and can reduce power rate.



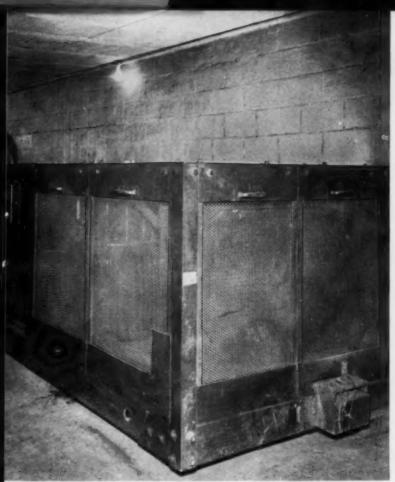


CONTINUITY OF PRODUCTION and flexibility of operation are promoted by G-E metal-clad switchgear. Factory-assembled, it is easily installed and maintained.

# System-engineered raises efficiency of



MORE DEPENDABLE G-E a-c mine power supply, used underground, steps down voltage close to the mining load, minimizing voltage drop, increases the efficiency of your mining machines.



**LOW COST CONVERSION** of power is obtained with portable G-E mining-type mercury-arc rectifiers. Move easily as face advances. Absence of major rotating parts reduces wear, shutdowns.



SPECIALLY DESIGNED for service reliability, rugged G-E totally enclosed fan-cooled Tri-Clad\* motors are also available in design approved by Bureau of Mines.

# G-E equipment underground mining

Modern General Electric equipment can give you the speed, flexibility and safety you need for more efficient underground mining. G.E. can also help in these ways: Latest electrical techniques are employed by G-E application engineers, working closely with you or your consultants, to give you the most flexible and lowest-cost system for your mining needs.

Extensive developmental facilities are constantly used by G-E product engineers in providing new and improved products to help you increase mining output and efficiency.

From early plans through start-up, G.E. can coordinate selection, delivery and installation of all your electric equipment, saving you engineering time and construction costs. For more information, contact your nearest G-E Apparatus Sales office, or write General Electric Co., Schenectady 5, N. Y.

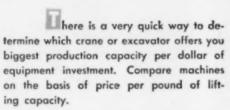


HIGH AVAILABILITY of G-E mine locomotives cuts costs. G.E. offers a variety of types which handle easily, efficiently, and help speed all haulage in underground mines.

\*Rea. trade-mark of General Electric Co.

**Engineered Electrical Systems for Underground Mining** 

GENERAL ELECTRIC



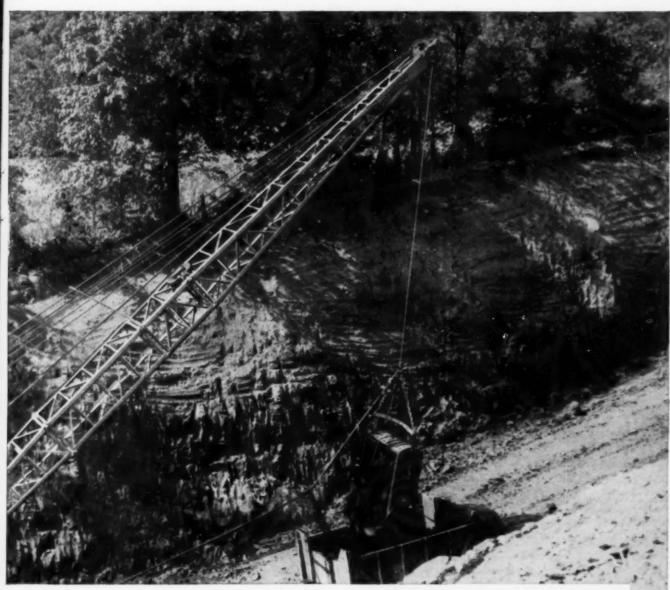
Remember, lift capacity is work capacity. Obviously, the machine with the heaviest lift rating not only picks up larger crane loads — it also has more strength and stability to handle bigger dragline and clamshell buckets on a wider work range — more power and speed to increase shovel and hoe production.

Check the Koehring lift capacities shown on the next page — then ask your Koehring distributor to give you the figures on price per pound of lifting capacity.



KOEHRING COMPANY Milwaukee 16, Wis.

Subsidiaries: JOHNSON PARSONS . KWIK-MIX



Check price per pound of lifting capacity



KOEHRING MODEL	SIZE DIPPER	KOEHRING LIF (Crawler ratings tipping load. Rub — 85% of tippi	PRICE PER POUND OF LIFT CAPACITY	
205 CRAWLER	1/2-Yd.	20,000 lbs.	30-foot boom at 10-ft. radius	3
205 ON RUBBER	½-Yd.	30,000 lbs.	25-foot boom at 12-ft. radius	?
304 CRAWLER	%-Yd.	27,800 lbs.	35-foot boom at 12-ft. radius	2
304 ON RUBBER	%-Yd.	50,000 lbs.	30-foot boom at 10-ft, radius	?
405 CRAWLER	1-Yd.	40,000 lbs.	40-foot boom at 12-ft. radius	?
605 CRAWLER	11/2-Yds.	72,300 lbs.	50-foot boom at 12-ft, radius	3
1005 CRAWLER	21/2-Yds.	159,000 lbs.	50-foot boom at 12-ft, radius	3

<sup>\*</sup>Figures available on request—ask your Koehring distributor for them.

#### 1,400 crash landings a minute...



Here's a beating your truck will never have to take. This INTERNATIONAL Truck is pounding over the Belgian Black course... a torture track so bumpy that, at only 12 miles per haur, it slams wheels up and down 1,400 times a minute—so rugged that drivers are replaced every 20 miles of the 400-mile test.



You save the BIG money in mine hauling with all-truck built INTER-NATIONALS. 200 basic models from 4,200 to 90,000 lbs. GVW—conventional and COE, 4-wheel, 6-wheel, four-wheel-drive. Axle and transmission ratios for every need.

#### All-Truck Built to save you the <u>BIG</u> money!

Top TV Comedy! Ronald Colman and Benita Hume in "The Halls of Ivy," CBS-TV. See your paper for date, time and channel.



#### to save you the BIG money

We torture INTERNATIONAL Trucks this way to be sure that sheet metal, cabs, springs and all running parts will stand up *longer*. So that our trucks will have utmost roadability, minimum wheel fight, maximum comfort. It's all a part of INTERNATIONAL engineering and design to save you the BIG money—the operating and upkeep money.

International engineers are never called upon to adapt passenger car engines or components. They design Internationals with extra margins of strength—build them to save you the BIG money in the long run.

Yet with all this all-truck extra value, Internationals are competitively priced. Let your International Dealer or Branch show you the right International for you—all-truck built to save you the BIG money!

INTERNATIONAL HARVESTER COMPANY . CHICAGO

#### INTERNATIONAL' TRUCKS

International Harvester Builds McCORMICK & Farm Equipment and FARMALL & Tractors ... Motor Trucks ... Industrial Power ... Refrigerators and Freezers



(Patented and Patents Pending)

21239

# Cuts and loads up to 8 TONS OF COAL PER MINUTE

There's only one safe way to buy a mining machine. Instead of rolling out price lists, roll up your sleeves and check production ability. How does your present equipment compare with the Goodman Boring Type Continuous Miner's cutting and loading rate of up to 8 tons of coal per minute? With its high percentage of coarse coal cut and loaded? Chances are it falls far short . . . for the Goodman Miner is the highest tonnage-producing mining and loading machine available today.

But don't forget to check maneuverability, too. Here's what the Goodman Miner can do:

 Suitable for all development work, including 90° crosscuts, and for complete pillar extraction.



Characteristic cutting pattern of Goodman Miner. Sides and roof are smooth and undisturbed. Bottom immediately ready for roadway.

- Follows seam irregularities by vertical or sideways tilt of cutting element.
- Cutting elements retract for tramming clearance at top, bottom and sides.
- Full hydraulic control of all machine movements for ease of handling.

Goodman Boring Type Miners are also far superior to conventional mining equipment in promoting concentrated working areas—requiring fewer man hours and less supervision—substantially reducing costs of installing, maintaining and extending roadways, roof support and power lines.

In short, the Goodman Miner is a profitable, self-amortizing investment from any viewpoint. Available for seams from 4'4" to 8'. For a more detailed description of its features and benefits, write for Catalog No. G-107... no obligation.

#### GOODMAN

MANUFACTURING COMPANY
Halsted Street and 48th Place, Chicago 9, Illinois

CUTTING MACHINES . CONVEYORS . LOADERS SHUTTLE CARS . LOCOMOTIVES . CONTINUOUS MINERS

# The New Allis-Chalmers Power Unit Line Delivers

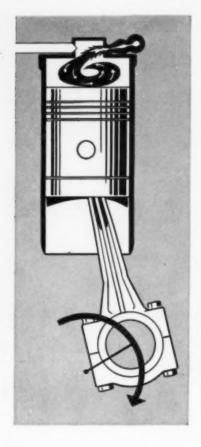
# LOWER COST POWER

Allis-Chalmers diesel power units provide a new kind of engine performance and extra-long life. Heart of this outstanding performance is a unique follow-through combustion. Here's how it works —

A blast from the energy cell (see drawing), thoroughly mixes air and fuel for complete burning in the combustion chamber. This results in peak efficiency, lower cylinder temperatures for more complete lubrication of walls, longer life for pistons and rings.

In addition, Allis-Chalmers power units are designed with seven main bearings, rigid blocks, removable "wet" cylinder sleeves, removable valve guides, full-length water jackets, full-pressure lubrication — all contributing to dependable, continuous, long life performance.

Ask your Allis-Chalmers dealer for the visual story revealing the full advantages of these engines.



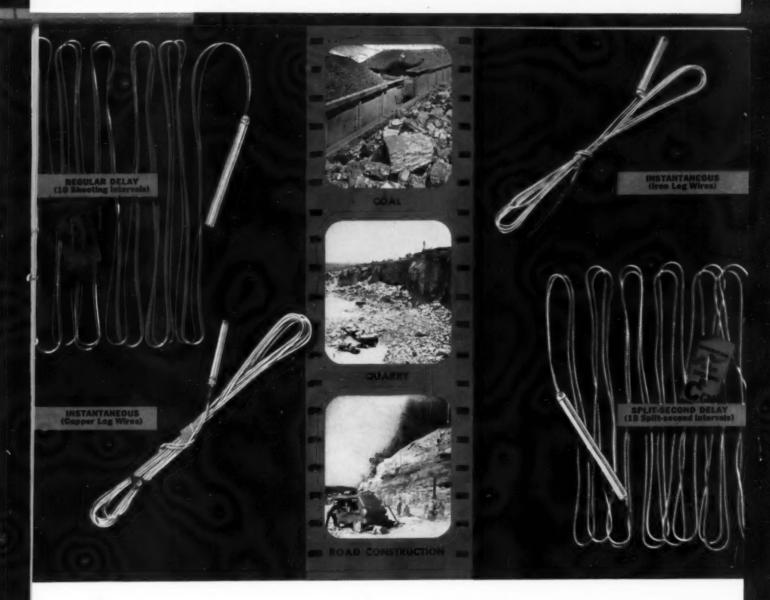


Five sizes of Allis-Chalmers diesel power units — ranging from 15 to 197 brake hp — are available as open style or complete self-contained units. They are compact and easily installed.

Illustrated: Model D-779

6-cylinder diesel 140 brake hp at 1400 rpm 779 cu in. displacement

ALLIS-CHALMERS



### Callyour shot... then call for American Electric Blasting Caps

#### ... for American makes a cap for every type of blasting

That's right, you call your shot—instantaneous, regular or split-second delay—in coal mines, in quarries or on construction jobs. Then use American Electric Blasting Caps, for American makes the *right* cap to set your shot off dependably and economically.

And American Electric Blasting Caps also offer these positive advantages:

Choice of Delays—10 regular delay periods and 15 split-second delay periods meet virtually every timing requirement.

Timing Accuracy—the finest timing periods are produced for exact planned shooting.

Detonation Strength - more than

enough to detonate most all insensitive dynamites.

Superior Insulation—five separate coats of Organosol insulation give unsurpassed electrical and strength properties.

And they're color coded for fast, sure identification.

The American Line:

High Explosives
Permissibles

**Electric Blasting Caps** 

Blasting Powder

Instantaneous

Blasting Caps

Regular delay

Caps Split-second delay

**Blasting Accessories** 

If it's American, it's dependable.



#### AMERICAN Cyanamid COMPANY

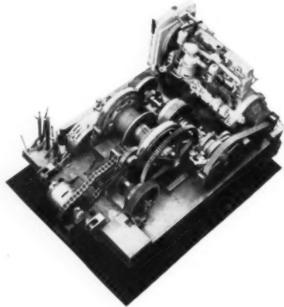
EXPLOSIVES DEPARTMENT

30 Rockefeller Plaza, New York 20, N. Y.

Sales Offices: Latrobe, Pa., Pottsville, Pa., Scranton, Pa., Maynard, Mass., St. Louis, Mo., Biuefield, W. Va.

# Simplicity of Design SPEEDS SERVICING IN YOUR PIT





Special care is taken to arrange deck machinery on Bucyrus-Erie excavators so it's easy to get at . . . so parts may be simply removed without dismantling other units.

#### **BUCYRUS-ERIE COMPANY**

accessible locations. All adjustments, including single-point wear adjustments on clutches and brakes, are easily made and stay put for long periods. Clutch bands are interchangeable and reversible end-for-end to simplify maintenance.

Design simplicity is only one of many Bucyrus-Erie features that add up to a higher percentage of actual working time each shift — and consequently to greater output and profits. Let your nearby Bucyrus-Erie distributor explain all of the features that make these machines standouts for output and economy in your loading and stripping operations. Ask about the 1½-cu. yd. 38-B (shown here), and

about these other popular favorites for mining

operations -the 2-yd. 51-B, the 21/2-yd. 54-B, the

Essential simplicity of design is one of many reasons Bucyrus-Erie excavators are preferred in the pits. It not only boosts output, but keeps maintenance low, machine-life long. One look at the deck machinery of a Bucyrus-Erie will show you how design simplicity makes a big difference in reducing maintenance delays. Parts are large, simple, few in number, easy to get at for replacing. Lubrication fittings are grouped at central, easily-

South Milwaukee, Wis.

75 Years of Service to Men Who Shape the Earth

3-yd. 71-B, and the 4-yd. 88-B.

## FAIRMON PREPARATION PLANTS



For over 58 years, Fairmont has met coal preparation requirements with planned thinking and coordinated production. This planning, from the very beginning, has made Fairmontbuilt plants pace-setters for separating efficiency and product up-grading. You see, when you operate a Fairmont built plant, you have separating facilities custom-designed to meet your specific requirements—an economical, independent selection of equipment to do the job makes this possible. In addition, your plant is prepared to cope with future production, as well as present, with little additional cost.

Take advantage of experience . . . call a Fairmont Engineer . . . plan today for increased separating efficiency with a Fairmont-built preparation plant that will guarantee product uniformity and quality at low operating cost.



#### **FAIRMONT**

MACHINERY COMPANY FAIRMONT, WEST VIRGINIA

DESIGNERS AND CONSTRUCTORS OF COMPLETE COAL PREPARATION PLANTS USING BOTH WET AND DRY CLEANING, CENTRIFUGAL AND THERMAL DRYING.

# NEW American HEAVY-DUTY

30-S CRUSHER

- V Crushes ROM Coal Rock, Slate, Sulphur Balls, and Gob ... without oversize
  - V Saves Labor Costs of Pickers
  - V Saves Coal

#### THE HEAVY-DUTY American PAYS OFF FOR THESE 3 MINES:

- CRESCENT COAL CO., Central City, Ky. "We have not spent a cent on this crusher since installation," writes the General Manager. It has eliminated two pickers . . . recovers coal previously thrown away on account of impurities. By crushing and washing, this coal is salvaged. Estimated average of 280 tons of coal and "gob" go through crusher every day. "In 18 years" experience with American Crushers, we know it is the most economical and ideal crusher for our operation.
- PERRY COAL CO., O'Fallon, Ill. Previous crusher required three men at the picking table, according to the Mine Superintendent. Today, only one operator is needed to remove wood and tramp metal. No replacement parts have been needed . . . recent inspection showed no signs of wear after 16 months' operation at a daily operation of 210 tons for 7" plus ROM coal. This Heavy-Duty American is one of five Americans installed at this mine.
- SOUTHWESTERN ILLINOIS COAL CO., Percy, III. "The Mine reports that the installation of the American Pulverizer #30-S crusher has been an excellent labor-saving device. In the 12 months of operation the crusher has had no parts replacements. Continued inspection and past American Crusher history indicate the maintenance of this crusher will be a very small item. Approximately 320 tons of coal per day go through this crusher."

Let American show you how you can profit by a 30-5 Heavy-Duty installation. We

Originators and Manufacturers of Ring Crushers and Pulverizers

1119 Macklind Ave. Saint Louis 10, Mo.

#### MINE POWER FEEDER CABLE

TODAY'S TOP SPECIFICATION FOR MINE POWER
DISTRIBUTION

NON-METALLIC ARMORED . . . shielded . . . Roebling high-voltage Mine Power Feeder Cable is perfectly adapted for practically every sort of power distribution requirement. You can suspend it vertically in shafts or boreholes; run it horizontally in underground entries or suspended from insulators. Since its outer sheath has high resistance to moisture, abrasion and other service hazards,

you can safely bury it direct in shallow trenches. Roebling Mine Power Feeder Cable has every construction feature that assures maximum safety, dependability and service life. Classified as semi-portable, it is exceptionally easy to move and handle under all conditions. Get complete information on Roebling Mine Power Feeder Cable from

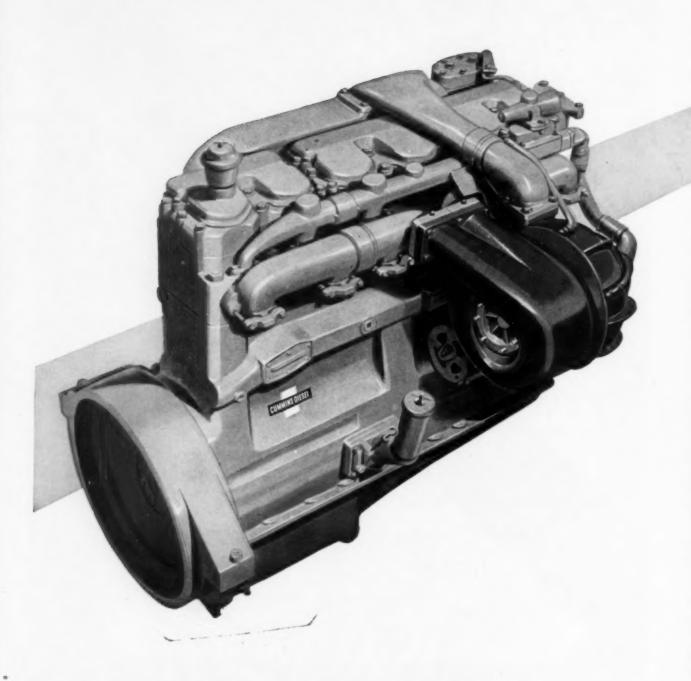
your Roebling distributor or by writing us.



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IST AVE. 5. . TULBA, 321 N. CHEVENNE ST. . EXPORT BALES OFFICE, 19 RECTOR ST., NEW YORK 6, N. Y.

### NEW TURBODIESEL



#### BY CUMMINS



# ups your production and lowers your costs!

Cummins 300 h.p. turbocharged NRT-6 pulls full loads faster, permits higher speeds on grades, cuts cycle time, because it produces greater horsepower without increase in engine size or displacement.

Turbocharging—which harnesses exhaust gases normally wasted—produces this extra horsepower by achieving a more perfect air-fuel mixture in the combustion chamber. There is no parasitic load as in supercharged engines. This means drastically reduced fuel costs . . . fewer internal stresses . . . longer engine life.

In addition, Cummins exclusive PT fuel system is simple and trouble-free . . . makes fuel system maintenance costs negligible. It is so easy to understand and work with that no specialists are needed. And all Cummins Diesels run on inexpensive No. 2 diesel fuel or furnace oil.

For further information, see the Cummins distributor in your area, or send us this coupon today.

#### CUMMINS

Cummins Engine Company, Inc. Columbus, Indiana

Leader in rugged, lightweight, high-speed diesels (60-600 h.p.)

Cummins Engine Company, Inc. Dept. A-9 Columbus, Indiana

Please send me detailed information on Cummins new NRT Turbodiesel.

Name

Company

Address

City\_\_\_\_\_State\_\_\_



#### They knew they were on the right track

After years of suffering along with coal spillage, under-size rolling stock and over-size maintenance costs, the owners of this large mine took the step they had known for years they ought to take. They modernized.

They replaced the old low-capacity cars with mammoth modern ones. Put on husky motive power to handle these larger loads. Streamlined operations at the face. And rebuilt the backbone of the mine—the track system—with a Bethlehem heavy-rail track system.

Before they'd had their new Bethlehem layout for a month they knew they were on the right track.

To begin with it didn't cost as much as they thought it would because Bethlehem designed it precisely to fit their needs, then pre-assembled it at Bethlehem's plant to assure perfect fitting with no wastage.

And when the heavy trains began to roll over the smooth new Bethlehem haulageways, the coal stayed right where it belonged—in the cars. The men felt the difference as they rode the man-trips. And the maintenance foreman noticed the greatest difference of all!

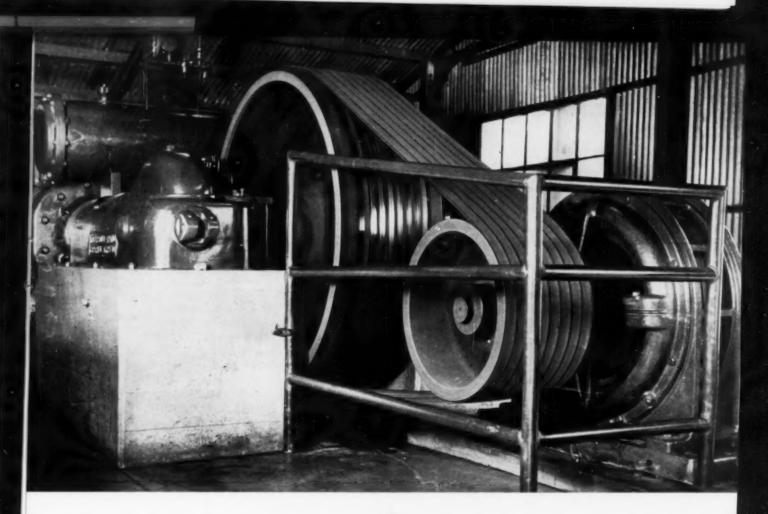
If you feel there is room for improvement in the haulage system in your mine, perhaps a discussion with a Bethlehem mine track engineer would help to put you on the right track. He will be glad to come see you at your convenience for a discussion of your problems. You can reach him through the nearest Bethlehem sales office.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation



#### BETHLEHEM STEEL

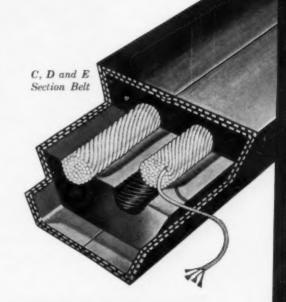


# Thermoid Multi-V Belts cut operating costs



There's a Thermoid V-Belt for every mining application. Every belt is *pre-stretched* to provide longer service and maximum power transmission without slippage. Thermoid C, D and E sections are rayon-grommeted for brute strength and extra flexibility that withstands repeated shock loads. The entire belt is vulcanized into a solid unit that resists moisture, abrasion, internal friction and heat.

Get longer wear with less maintenance . . . cut your operating costs with Thermoid Multi-V Belts. To meet the exacting requirements of mining service, your Thermoid Distributor carries a complete line of Thermoid Multi-V Belts, Hose and Conveyor Belting. Call him or write direct for complete information.



Conveyor & Elevator Belting • Transmission Belting F.H.P. & Multiple V-Belts • Wrapped & Molded Hose



Rubber Sheet Packings • Molded Products, Industrial Brake Linings and Eriction Materials

Thermoid Company . Offices & Factories: Trenton, N. J., Nephi, Utah

FOR AUTOMATIC POWER-APPLICATION OF LIQUID, SEMI-LIQUID OR MASTIC MATERIALS ABOVE OR BELOW GROUND . . .

# You'll save up to 50% in

# WITH LINCOLN ADVANCED DESIGNED BALANCED-POWER PUMPING SYSTEMS

Continuous, uniform delivery through long hose or pump lines is now made possible by Lincoln's revolutionary Balanced-Power pump design plus exclusive, patented, automatic Pressure-Flow Equalizer. Here's the first materials application pump with a long, perfectly balanced dual piston stroke for smooth, easily controlled spray or flow delivery. Lincoln Systems are available in complete packaged units for use with original 400-lb. drums or 5-gallon containers. Individual components also available for easy assembly of custom designed rigs.

#### USE IT TO CUT YOUR COSTS IN APPLYING A VAST RANGE OF MATERIALS INCLUDING...

- insulation
- protective coatings
- waterproofing
- adhesives
- caulking materials
- sealing compounds



Lincoln Balanced-Power System used to apply sealing materials to roof of mine

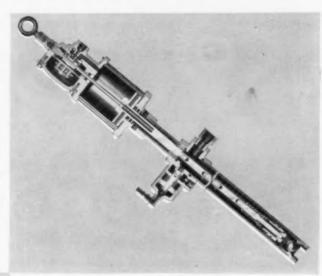


# time and handling costs

These Two Units Combine to Give You Unmatched Pumping Performance

#### 1. Balanced-Power Dispensing Pumps

Built for continuous, trouble-free service. Stall-proof!
Leak-proof! Pre-lubricated! Toggle action assures
positive tripping of Air Valve. Toggle, under constant pressure of the Air Piston, holds "D" Valve
in positive position. Extra heavy duty construction
for prolonged, dependable operation. Self-polishing brass Air-Motor Cylinder resists corrosion. AirMotor operates freely even at extremely low air
pressures. No oiling required. Extra large air passages, especially designed to offer minimum restriction to air flow insuring super efficient operation.



# spray gun regulator pump gun gun air supply material hose

For more information on Lincoln Materials Pumping Systems, send the coupon for Catalog No. 41.

#### 2. Automatic Pressure Flow Equalizer\*

Eliminates surge or blob of material when opening spray head...saves time, material and insures better application. Provides automatic, remote control of pump operation from the spray head...saves time and labor. Assures precision controlled, uniform application of material. Increases service-life of pump and hose. Permits pre-agitation of material in drum to obtain uniform mixture and texture before spraying.

\*Trade Name Registered

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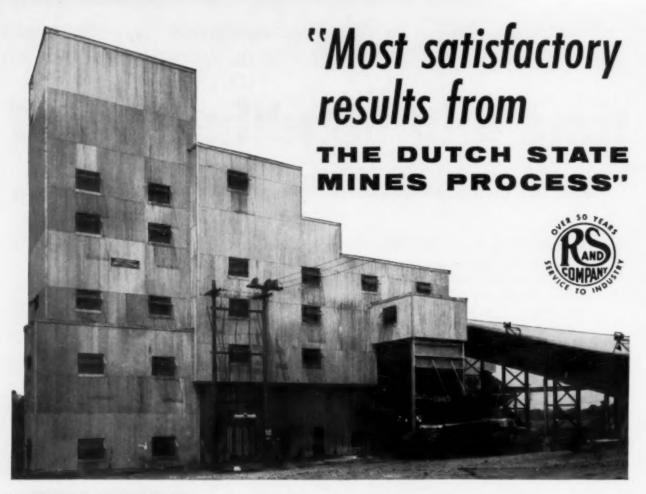
Please send me FREE copy of Catalog No. 41

Name Title

Company

Address

LINCOLN ENGINEERING COMPANY





Dutch State Mines heavy medium process showing the static pool vessel and flights removing pure coal.



Pure coal after the final rinse.

says Frank Nugent, Executive Vice President, Freeman Coal Mining Corporation, speaking of his experience with the Dutch State Mines heavy medium separation process installed by Roberts & Schaefer in Freeman Mine No. 4 Williamson County, Illinois.

Freeman had approached R & S engineers with the problem of obtaining high quality coal from their new mine operating in the quality circle in Southern Illinois. This was the perfect application for the recently acquired Dutch State Mines process. With more than 50 years of coal preparation plant experience, including the designing and building of the most modern washing equipment for normal coal preparation, Roberts & Schaefer had realized that the trends required more precise cleaning. They had, therefore, secured the franchise to market the Dutch State Mines process in the United States. R & S were ready. Freeman needed the best coal washing equipment in the world—and they got it!

The plant has now been in operation for over six months and has thoroughly proved its efficiency; in fact, results are far better than were originally thought possible. As a result, Freeman is producing quality coal for quality customers.

Do you have a washing problem that is unusually severe? Possibly the Dutch State Mines process is what you need to solve it. Phone, wire or write for consultation.

#### ROBERTS and SCHAEFER COMPANY

SUBSIDIARY OF THOMPSON-STARRETT COMPANY, INC.

ENGINEERS AND CONTRACTORS

130 North Wells Street, Chicago 6, Illinois

New York 19, N. Y.—254 West 54th Street Pittsburgh 22, Pa.—1315 Oliver Building Huntington 9, W. Va.—P. O. Box 570 Hibbing, Minnesota—P. O. Box 675

# Speed reducer at Fairview Collieries Corp. uses STANOIL Industrial Oil— operates 5 years with no mechanical maintenance



Management of Fairview Collieries Corp., Danville, Illinois, had had experience with Stanoil Industrial Oil. So when it came to selecting an oil for a speed reducer in the preparation plant, the choice was easy—Stanoil.

The speed reducer is connected to a belt conveyor that moves nearly 10 tons of coal per minute. A shut down of the speed reducer means the conveyor belt stops and the whole plant shuts down. Obviously this is no place for oil failure. Obviously, too, it is the place for STANOIL Industrial Oil.

STANOIL in the speed reducer is changed approximately every twelve months. After five years' continuous operation, the speed reducer is in excellent condition. Herringbone gears and other parts show no evidence of wear. No maintenance work has been necessary. No shutdown has occurred due to lubrication failure.

Ask your Standard Oil lubrication specialist about Stanoil Industrial Oil. In the Midwest, call your nearby Standard Oil office. Or contact Standard Oil Company, 910 So. Michigan Ave., Chicago 80, Ill.

Bert Richardson (left), Preparation Plant Superintendent, and Fred A. Barnes, Standard Oil lubrication specialist inspect Jones speed reducer at Fairview Collieries. Fred Barnes' customers have found that he is a good man to call in on lubrication matters. Fred has had 18 years' experience providing lubrication technical service to Standard Oil customers. He's a graduate of James Millikin University and of the Standard Oil Engineering School.

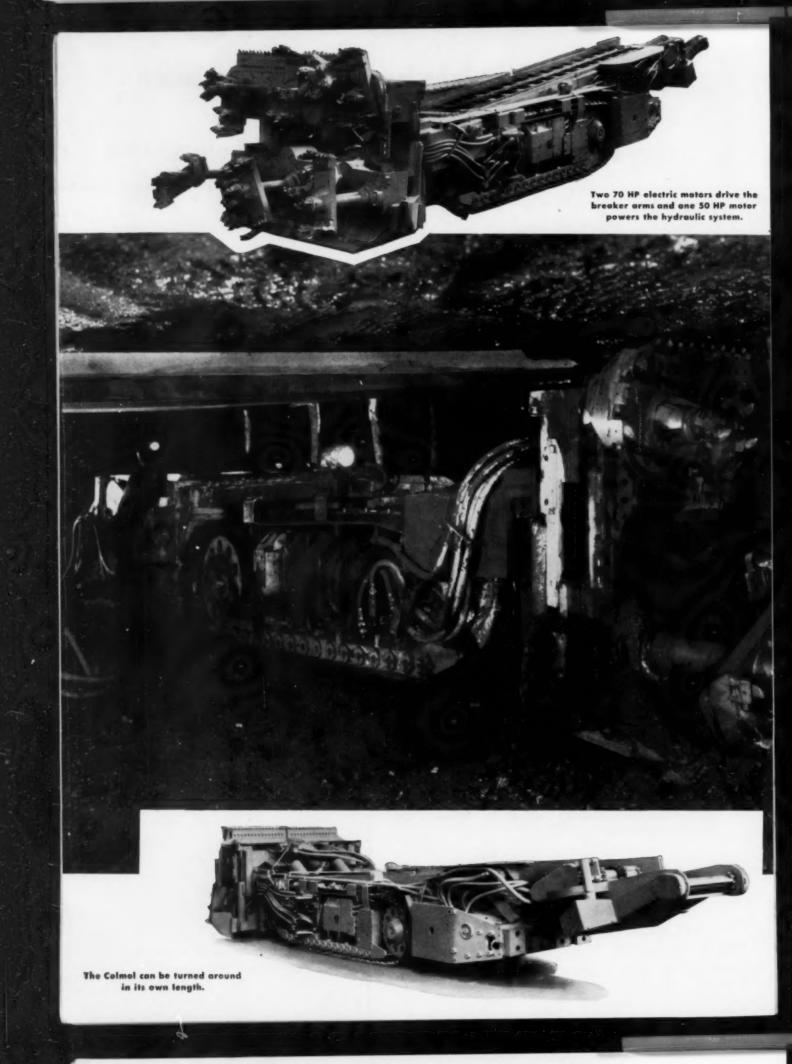
STANDARD OIL COMPANY

(Indiana)



#### Quick facts about STANOIL Industrial Oil

- Stability. STANOIL's antioxidant gives oil resistance to chemical change, minimizes deposits.
- 2 Rust Prevention. Inhibitor in STANOIL "plates out" on metal surfaces prevents corrosion.
- 3 Cold Starts. STANOIL has low pour point. Flows freely from cold start. No need for costly warm ups.
- 4 Resists Effects of Temperature Change. STANOIL has high viscosity index, is resistant to change in both high and low temperature service.
- 5 Excellent Demulsibility. STANOIL is refined to eliminate emulsion problems, contains additive to minimize foaming.



## Up to 100 tons per man-shift...

continuous mining in medium height veins

with the



3 MODELS

HEIGHT OF CUT:

46½" to 55"

50½" to 64"

56½" to 72"

WIDTH OF CUT: 9'8" approx.

# 76-B JEFFREY COLMOL®

(PATENTED)

A COLMOL working a West Virginia seam with a crew of seven has produced 900 tons of coal in a single shift—an even better record than the 100-ton per man-shift figure normally set as a goal for this powerful Jeffrey continuous mining machine. Evidence again of the high tonnage production possible with the Colmol.

Ten sturdy rotating cutters attack any coal seam ranging from  $46\frac{1}{2}$ " to 72" in height, according to the model chosen. All coal in an area 9'8" wide is brought down, swept into the conveyor, and is discharged at the rear. The cutter arms operate at a speed of less than 60 RPM, breaking off the coal and producing a screen consist comparable, in most seams of coal, to conventional mining.

This 70,000-pound giant advances steadily on long, wide crawlers with little noise, vibration or dust. The head can be raised, lowered or tilted to follow irregularities in the seam. The discharge conveyor swings 31 degrees to either side, to make loading into a shuttle car easy. All adjustments are hydraulic and can be made instantly and accurately. Controls are centralized for convenience and safety; once they've been set, they need very little attention, reducing operator fatigue.

The Colmol is sturdy, suiting it to the toughest mining jobs. Operating parts, both electrical and hydraulic, are readily accessible. Thus servicing, minor repairs and adjustments can be made at the face, holding downtime to a minimum.

If you're thinking of new continuous-mining equipment, ask to hear Jeffrey's story on the 76-B Colmol. Its high productive capacity and the long, trouble-free service it provides will make it a moneymaker for you.

Write to: Mining Sales Division, The Jeffery Manufacturing Company, Columbus 16, Ohio. District Offices in: Beckley, Birmingham, Chicago, Denver, Pittsburgh, Harlan, Salt Lake City.



MINING, CONVEYING, PROCESSING EQUIPMENT
TRANSMISSION MACHINERY • CONTRACT MANUFACTURING



## Fast dozing and reverse speeds put OC-18 money ahead on strip operations

The high performance diesel engine in the Oliver OC-18 crawler has an exceptional torque span that steps up lugging as the tractor slows under load. In first gear, the OC-18 delivers 31,000 drawbar pounds' pull at 1½ miles per nour!

With power like this to back you, those long, heavy dozing runs go fast. And with a high reverse gear of 3½ miles per hour, the OC-18 clips even more time from your dozing cycle. You'll be able to move more yards in

less time-pile up bigger profits on every job.

This husky crawler packs a big 133 drawbar horsepower. But powerful as it is, it operates with the ease of an automobile. Finger-tip air steering, clustered controls, center-positioned gear shift and comfortable seat are features that cut operator fatigue, increase performance and productivity.

For the real test, try this tractor yourself. See why you can do a bigger, better job at less cost with the Oliver OC-18. Call or visit your Oliver Industrial Distributor for a demonstration.

#### THE OLIVER CORPORATION

400 West Madison Street, Chicago 6, Illinois



A complete line of industrial wheel and crawler tractors



Jalloy Plates outlast other steels by margins of 4 to 1



Jalloy lowers maintenance costs on ore and coal conveyors



Jalloy provides longer wear with less repair in truck bodies

## FACING A TOUGH PROPOSITION?

you can beat it with JALLOY

Only a seasoned hunter with the right equipment can stand up to a charging rhino. And, likewise, only a special steel like JALLOY can withstand severe impact and abrasion . . . day after day. In comparison with mild steels as well as other abrasion-resistant steels, JALLOY gives outstanding results when heat-treated to your specifications.

This modern heat-treated plate brings savings in steel costs, maintenance, and repair, and also is easily welded. JALLOY is available in three grades, each of which is designed for specific applications.



Complete data concerning CHEM-ICAL COMPOSITION . . . HEAT TREATMENT . . . WELDABILITY . . . PHYSICAL PROPERTIES . . . will be mailed to you promptly. Write today.



Jones 4 Laughlin

STEEL CORPORATION - Pittsburgh



Jalloy Aprons in Tyrock screen last 3 times as long as other steels

#### Jalloy heat-treated steel plate beats wear due to impact and abrasion

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Please mail	complete data concerning Jalloy
Please have	your representative call.
riedse nove	you representative can.
Name	
Name Title	
Title	1
Title Company	
Title	

# HOW TO BUY CONVEYOR BELTS

and get...

MORE USE PER DOLLAR

where
SPECIAL ENGINEERING
is needed

Look for a make of belt backed by experienced, specialized engineering service.

Selecting the right conveyor belt to solve a special problem begins with selecting the right representative . . . one who will take interest in your particular belt needs and refer your problems to his factory if engineering help is required. Where a company makes a wide selection of conveyor belts for many applications, the representative can often recommend a feature construction to meet your job requirements. Where your problem is unique, that company backs its field men with custom engineering and comes up with a recommendation to meet your specific operating conditions.

Choose the company that offers complete belt engineering service . . . the source of supply that maintains close contact between factory and field.





#### RAYBESTOS-MANHATTAN CONVEYOR BELT ENGINEERING

A leading steel mill, faced with handling hot sintered ore without an insulating layer of "fines", had numerous belt failures due to charring.

An R/M representative called in a factory engineer. A new customengineered R/M conveyor belt with special cover now saves hundreds of dollars a year at the mill.

and...where hot ash and clinker was wearing out a conveyor belt every month at a Michigan cement plant, an R/M field man was able to furnish a specially engineered Homocord Belt which has outlived the best previous belt four times over.

and ... special, "chevron cleated" conveyor belt was developed by

R/M, as a result of a field representative request, to replace a smooth surfaced belt unable to carry wet iron ore up a mine slope without costly spillage.

These are just a few of many instances where R/M engineering service has solved conveyor belt problems. In other cases, special job requirements have been met with R/M's exclusive constructions such as extra-flexible Ray-Man "F" . . . extra-cushioned Homocord for shock-loading . . . and Ray-Man Tension-Master for extra-high tensions and long lifts.

Let an R/M representative show you why R/M engineering makes R/M Conveyor Belts last much longer ... give you "More Use per Dollar".

00A-502-A00



MANHATTAN RUBBER DIVISION-PASSAIC, NEW JERSEY

#### RAYBESTOS-MANHATTAN, INC.













s V-Belts Conveyor Belts Hose

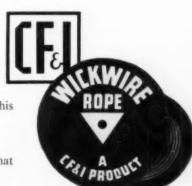
Tank Lining Abrasive Whee

Other R/M products include: Industrial Rubber • Fon Belts • Radiator Hose • Brake Linings • Brake Blacks • Clutch Facings
Asbestos Textiles • Packings • Engineered Plastic, and Sintered Metal Products • Bowling Balls



## WHAT IS A WICKWIRE ROPE DISTRIBUTOR?

- · He's quality people...handling quality products.
- He knows the local industries he serves, and he knows wire rope.
- He solves your wire rope problems. His own first-hand knowledge and experience are backed up by the technical assistance of Wickwire Sales Engineers.
- He brings you Wickwire Rope and Slings at the lowest possible cost, because he spreads his
  sales and distribution expense over the hundreds of related items he carries.
- He stocks exactly what you need, saving you time, paper work and storage space.
- He's a good man to know. Buy your Wickwire Rope and Slings from him. You'll find that
  the many valuable services he offers far outweigh any apparent price advantage
  you might gain by buying direct.





#### Most Modern Design! Most Modern Power!

Get both in new Chevrolet Task-Force trucks. Modern styling that actually works for you! Modern power in the shortest stroke V8's\* in any leading truck!

Styling that's designed to make money for you—It's a fact. The ultra-modern, Powermatic design of a new Chevrolet Task-Force truck calls attention to your business, favorably impresses customers and prospective customers! That's why on looks alone a Task-Force truck can make money for you. And it's functional styling. Panoramic windshield, new High-Level ventilation, concealed Safety Steps—these are styling features that double in brass to make the driver's job less of a chore. With safety and comfort increased, efficiency goes up. Tight schedules

are easier to maintain and you keep the profits coming in on time.

V8 power—unmatched for efficiency!—Chevrolet brings you the industry's most advanced short-stroke V8 engines! The compact, super-efficient design of these great V8's reduces friction and wear ... delivers a higher output per pound of engine weight. You save on upkeep and operating costs! And with a modern 12-volt electrical system, you get double the voltage for quicker starting plus a greater reserve of electrical power. With two power-packed V8's and five gassaving 6's—it's the greatest engine choice in Chevrolet truck history! See your Chevrolet dealer for details. . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

 $^*V8$  standard in the new L.C.F. models, an extra-cost option in all others except Forward-Control models.

## NEW CHEVROLET Task-Force TRUCKS



**NEOPRENE BELTS CUT OPERATING COSTS** because only neoprene conveyor covers offer the *balanced* resistance to chipping, cutting, abrasion, heat, weathering, grease and oil needed for long, trouble-free performance. With neoprene, you get low operating and maintenance cost performance *plus* an important extra—mine safety, since neoprene does not propagate flame. That's why it pays to *specify neoprene*—the same tough, safe material used for jacketing *all* mine-trailing cable.

#### NEOPRENE

The rubber made by Du Pont since 1932

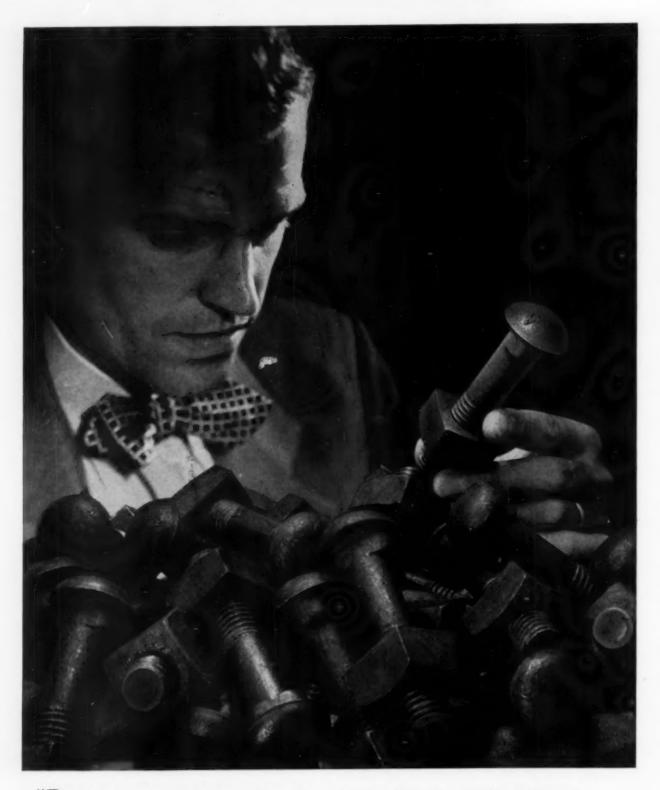


Better Things for Better Living . . . through Chamletry

#### FREE! THE NEOPRENE NOTEBOOK

Every issue contains new illustrated case histories, interesting articles, new ways to save with neoprene. Mail this coupon today to E. I. de Pont de Nemours & Co. (Inc.), Elastomers Division CO-9, Wilmington 98, Delaware.

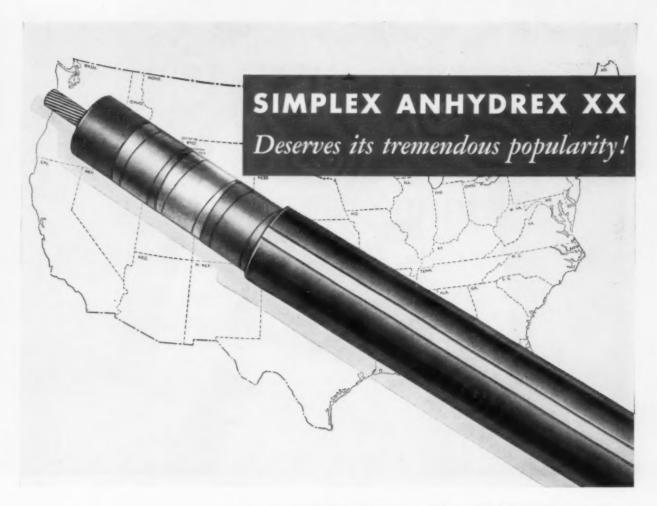
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"Bethlehem Track Bolts have strong, oval necks, rolled threads, and accurately formed heads. No wonder we like them."

Spikes and machine bolts, too!





- Simplex-ANHYDREX XX insulation is made for cable operating at 3kv to 25kv and over.
- It resists heat, ozone, oxidation and water even AFTER aging for 7 days at 250°F.
- Rated at 85°C. to 15kv and at 80°C. above that, it's used in ducts, overhead on messenger wires, or underground.
- · ANHYDREX XX eliminates need of a lead sheath.
- It eliminates problems of oil migration, sheath creeping, corrosion, electrolysis, bonding and joint wiping.
- ANHYDREX XX-insulated cable is lighter and more flexible than lead-covered cable.
- ANHYDREX XX Cable is made with a tough neoprene jacket, submarine armor wire, or other suitable outer covering.

Simplex Bulletin 1009A tells more about ANHY-DREX XX high voltage insulation. Write for it today.

ANHYDREX XX CABLE

SIMPLEX WIRE & CABLE CO., 79 Sidney Street, Cambridge 39, Mass.



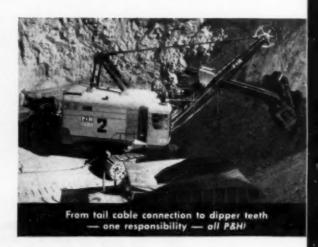
#### Soft touch for top tonnage! **ELECTRONIC CONTROL** P&H

WHAT! . . . a control system that can make as much as 10% difference in electric shovel production? Yes, it can . . . and does! Actual tests reveal these two outstanding reasons:

ONE: Electronic Control is practically effortless. As a matter of fact, P&H Electronic Control was so completely effortless that we had to build in a slight one-lb. pressure so the operator could feel it. Result: The fatigue factor is so minimized that production at the end of the shift is comparable with that at the beginning!

TWO: Electronic Control through thyratron application provides instantaneous shovel response on all motions! Convenient grouping of controls lets operator and machine perform at peak efficiency under all operating conditions.

P&H electronic control users say it's the last step in the evolution of fine controls. We will gladly send full information. P&H Electric Shovel Division, Harnischfeger Corporation, Milwaukee 46, Wis.



## HARNISCHFEGER



















# Now-Du Pont Offers Two New Blasting Agents for Overburden Shooting

#### **DU PONT "NITRAMITE"**

#### DU PONT AKREMITE

Manufactured and sold throughout the country in a wide variety of sizes.

## AVAILABILITY Large diameters only

Can be manufactured and used by consumers under sublicense or purchased for use from sublicensed explosive manufacturers.

Popular combination of high strength and low cost.

#### **ECONOMY**

Lowest-cost blasting agent developed to date.

Excellent blasting action in both hard and soft materials and either vertical or horizontal holes.

#### VERSATILITY

Proven performance in bituminous-coal strip pits. Potential application in wide variety of bank shooting.

Good water resistance—can be loaded in water if shot within eight hours.

#### WATER RESISTANCE

Recommended for loading in substantially dry holes. Package is moisture-resistant.

Cannot be accidentally detonated by shock, friction, rifle bullets, "Primacord," or a blasting cap. Should be primed with a special insensitive "Nitramite" Primer, which must be initiated with "Primacord."

#### SAFETY

Cannot be accidentally detonated by shock, friction, rifle bullets, "Primacord," or a blasting cap. May be primed with dynamite in standard wrappers or flexible plastic bags, or for maximum safety, "Nitramite" Primers.

Furnished in a substantial container that is easy to handle and load—even in usually troublesome horizontal holes.

#### CONVENIENCE

Packaged in a flexible plastic bag that loads easily and conforms to shape of borehole.

Contains no Nitroglycerin and cannot produce "powder" headaches.

#### NO HEADACHES

Contains no Nitroglycerin and cannot produce "powder" headaches.

E. I. du Pont de Nemours & Co. (Inc.), Explosives Dept., Wilmington 98, Delaware \*Licensed exclusively to the Du Pont Company under the Maumee Collieries Company Process Patent No. 2,703,528.

#### **DU PONT BLASTING AGENTS**



BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY



At Anaconda, we know firsthand the enemies of cable life: water, abrasion, excess tension, run-overs—in our own mines. This experience helps us make better cable for your mine use.

## Get 300% longer service with Anaconda mine-tested cable

Day-in, day-out mine experience helps us make shuttle car cable that really resists enemies of cable life.

Users tell us today's Anaconda flattwin cable lasts 3 times longer than the cable they used only a few years ago. What makes this Anaconda cable better? Its jacket is specially compounded neoprene. You can't tear, cut or abrade it easily. Insulation is a new crush-resistant form of rubber, making this cable tougher and vastly more flame-resistant. And an improved stranding and a brand-new ground wire make it a lot safer to handle. Your Distributor can give you full facts. Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y.

## ANACONDA

MINE CABLE

FLAT-TWIN CABLE



Improved stranding, new insulation, new grounding wire, and neoprene jacket make this a superior cable for shuttle cars, continuous miners, loaders, drill frucks, cutters. POWER CABLES



AnacondA Types W & G ore rugged, sturdy and long-lived. Used for mine power, shovels, continuous miners, loaders, drill trucks, cutters.

SHOVEL AND DRILL CABLES



Securityflex\* Types W and G are used with small shovels, self-propelled drill trucks, pumps and ac mining equipment. For higher voltages, Type SH cables (shielded) are recommended. SECURITYFLEX CORDS



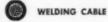
Unexcelled for strength, wear resistance and long life. Type SO (heavy-duty) provides superior service on remote control and hand drills.

TROLLEY WIRE



TELEPHONE CABLE

SHOT-FIRE CORD



## Delivery from Stock in every coal mining area...

# ROOF BITS Firthite "Blue Bits" for roof drilling are made in 3 styles: RDL for light uses and very soft roof rocks; RDH with extra heavy duty insert to resist gage wear for most difficult roof drilling; RDS (slotted) for faster drilling of medium to hard roofs. All are water

## FIRTHITE

BLUE BIT"

#### **MINING TOOLS**

## Increased Distribution in Eastern Kentucky

Greater availability of Firthite "Blue Bits" from field stocks in Bell, Clay, Harlan, Knox, Leslie, Perry and Whitley Counties has now been assured by the appointment of McComb Supply Company, Harlan, Ky., as an authorized Firthite "Blue Bit" distributor. All necessary grades, sizes and styles are stocked for immediate delivery . . . in roof bits, drill bits, machine bits and finger bits.

You can count on these rugged, dependable, proved-in-the-mine tools to reduce mining costs by minimizing down-time, provide maximum tool life and out-perform conventional tools in the toughest applications.

#### DRILL BITS

dry work.

Firthite "Blue Bits" for rotary drilling available in 3 styles:— D with either square or hex shank for use with any standard drilling equipment; DV (illustrated) for faster and easier hand held drilling.

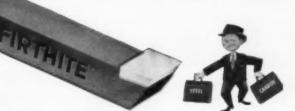
channeled for either wet or



Firthite "Blue Bits" for mining machines include bit design, style and grade for every need from light to rugged condition on continuous mining equipment.

#### FINGER BITS

Firthite "Blue Bits" for use in standard drill heads feature two-surface brazing with tips set in recesses for greater strength. Available in all popular sizes.



#### Mr. Tooley says-

"Firthite 'Blue Bits' are better because Firth Sterling makes both steels and carbides. Tool steel shanks and Firthite Carbide inserts are perfectly matched by one manufacturing source for maximum quality."

## Firth Sterling

GENERAL OFFICES: 3113 FORBES ST., PITTSBURGH 30, PA.

AUSTIN POWDER COMPANY—Cleveland, Waynesburg, Evansburg, Madisonville
U. S. STEEL SUPPLY COMPANY—Pittsburgh

AMOS A. CULP—Birmingham
MOLE-BITS COMPANY—Johnstown

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High Speed Steels
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PRODUCTS OF FIRTH STERLING METALLURGY

COAL AGE . September, 1955



# tram hauls 2,000,000 tons of material — and is still going strong!



15 years of service hauling mine refuse and these Tiger Brand Wire Ropes still have lots of life in them.

The Island Creek Coal Company in Holden, West Virginia needed a low-cost method of getting rid of mine refuse. So they built this tramway in 1939, using Tiger Brand Wire Rope.

In fifteen years, they hauled more than 2,000,000 tons of material and dumped it over the next hill out of the way. An examination of the track cables showed that they were still in good condition in spite of the fact that they get covered with abrasive rock dust.

Service like this is not unusual. We know of many Tiger Brand Ropes on heavy-duty mining and construction equipment that have moved a million or more yards before replacement.

On any job, the correct Tiger Brand Rope gives you the longest possible service...steady rope-after-rope performance that keeps costs down.

Send the coupon for more information on Tiger Brand Wire Ropes.

#### FREE ROPE BOOKLET

American Steel & Wire Rockefeller Building, Dept. J-95 Cleveland 13, Ohio

Please send me, without obligation, a copy of your helpful wire rope selection guide, "The Right Rope for the Job."

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AMERICAN STEEL & WIRE DIVISION, UNITED STATES STEEL, GENERAL OFFICES: CLEVELAND, OHIO COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO - TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS UNITED STATES STEEL EXPORT COMPANY, NEW YORK

#### **USS AMERICAN TIGER BRAND WIRE ROPE**

Excellay Preformed



UNITED STATES STEEL





#### What Electrical Connectors would you choose ...for these installations?

Modern mining techniques allow little time for coddling men or equipment . . . so it's a safe bet your answer to the question in our headline will be based on more than just the electrical requirements of the equipment. Such important considerations as safety, efficiency, durability and maintenance cost, will influence your selection. This is as it should be and we're glad it's true . . . for the mining industry's constant search for the best available equipment has made JOY Electrical Connectors their preferred choice since 1928.

#### Why settle for less ... when the best costs less in the long run?

JOY plugs and receptacles are specifically designed to provide JOY plugs and receptacies are specifically designed to provide long-range, maintenance-free service under the most adverse operating conditions... and they're available in styles and sizes to meet every mining need. Two of the currently most popular designs for mining installations are illustrated at right. Equipped with non-corrosive metal couplings and flame-resistant Neoprene bodies, both are moisture-tight, shatter-proof and distortion-resistant.

Straight Pin Bigun (SPB)—Have threaded metal couplings. Plugs are factory-vulcanized to 36" cable leads or to lengths as specified. See Bulletin B39a for complete information.

Attachable "Quik-Loe" styles— Attach quickly to customer's own cable. Newly designed couplings completely engage or disengage in ¼ turn. See Bulletin B57 for complete details.

JOY plugs and receptacles are available for both AC and DC applications. In addition, "SPB" and "Quik-Loc" connectors may be supplied with pilot control contacts for permissible of tration when used in conjunction with JOY'S Bureau of Mines-Approved distribution centers (SCC units). Ask us for complete information, Joy Manufacturing Company, Henry W. Oliver Building, Pittsburgh (22) Pa. In Canada: Joy Manufacturing Co. (Canada) Limited, Galt, Ont.









SPEED WITH NO SACRIFICE OF POWER . GREATER VEHICLE UTILITY . LONGER TRUCK LIFE REDUCED MAINTENANCE . REDUCED STRESS AND WEAR ON ENGINE AND TRUCK PARTS QUICKER TRIPS HOUSANDS OF TROUBLE-FREE ORE PAYLOAD **EATON 2-SPEED AXLES** HIGHER TRADE ER OPERATION SHER TRADE-IN GREATER VEHIC **CUT COSTS FOR** MORE PAYLOA DUCED STRESS AND WEAR O ER TRUCK LIFE ERATING COST QUICKER TRIPS TRUCK OPERATORS QUICKER TRIPS EXTRA THOUS GREATER VEHIC MAINTENANCE SAFER OPERATION . LESS TIME IN THE SHOP . HIGHER TRADE-IN VALUE . MORE PAYLOAD QUICKER **OPERATI** YTRA THOUSANDS OF TROUBLE-FREE MILES VEAR ON F REDU TRUCK PARTS RUCK LIFE SPEEED

The experience of thousands of truck operators in practically every industry shows that trucks equipped with Eaton 2-Speeds haul more, quicker, at lower cost per mile; spend more hours on the job, less time in the shop; last longer, and are worth more on the trade-in. Performance records prove that with reduced operating and maintenance costs, Eaton 2-Speeds pay for themselves over and over.



More than Two Million Eaton Axles in Trucks Today!

Ask your truck dealer for complete information.

## EATON

AXLE DIVISION -

MANUFACTURING COMPANY
CLEVELAND, OHIO

PRODUCTS: Sodium Cooled, Poppet, and Free Valves a Tappets a Hydraulic Valve Lifters a Valve Seat Inserts a Jet Engine Parts a Rotor Pumps a Motor Truck Axles a Permanent Mold Gray Iron Castings a Heater-Defroster Units a Snap Rings Springtites a Spring Washers a Cold Drawn Steel a Stampings a Leaf and Coil Springs a Dynamatic Drives, Brakes, Dynamometers

## This shuttle car cable won't bend on its major axis

A properly interlocked construction locks sheath to insulated conductors... insulated conductors can't slip within the sheath...cable bends only on minor axis... preventing separation of insulated conductors and sheath, and weak spots from damaging strain and crimping.



1 The brawny gent in these pictures is trying to forcebend a length of Rome 60 Parallel Duplex—but try as he will, he can't make a wrong-way bend in the parallel conductors...

Prove it for yourself. Send for a two-foot sample length and put it through this test. See how properly designed shuttle car cable like Rome 60 Parallel Duplex with its interlocked construction, prevents damaging wrong-way bends. It lasts longer—reduces down time—saves you money.



2 ... the interlocked construction won't allow insulated conductors to slip within the sheath. The cable is rigid on the major axis. When it's

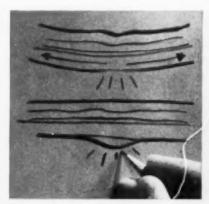
flexed the wrong way, it flops over and bends on its minor axis, eliminating damaging wrong-way bends.

## The Rome 60® line includes:

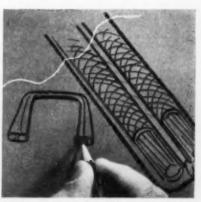
Single-Conductor Locomotive Cables • Concentric Mining Machine Cables • Flat Twin (Parallel Duplex) Mining Machine Cables—Types W and G • Type SO Portable Cords • Multiple-Conductor Portable Power Cables—Types W and G • Shot Firing Cord • Mine Power Distribution Cable • Shovel and Dredge Cables



3 Think of it as an "interlocked" construction, because that's really what it is. The open braid around each insulated conductor makes a crisscross tread-like surface. The molded-in-lead Neoprene sheath and the conductors mesh together.



4 In a duplex cable without interlocking, a hard wrong-way bend on its major axis will make the insulated conductors sitp, allow the cable to become distorted. When the cable is straightened out, one conductor is stretched, the other may be crimped. There's a weak point which invites breakdown from further flexing, tension, or twisting.



**5** Now try to force-bend a length of Rome 60 Duplex Cable. The insulated conductors won't slip, because of the permanent interlocking. The cable takes the path of least resistance, flops over and bends safely on its minor axis. No damaging crimping or strain. No trouble-making weak spot or separation of insulated conductors and sheath.

It Costs Less to Buy the Best





This special drill rig, designed by Anthony Schacikoski, General Superintendent of Leechburg's mining operations, makes drilling easier takes full advantage of Kennametal roof bits and the Jeffrey drill,

## Kennametal\* HFD roof bits last longer than other carbide bits at Leechburg Mining Company

At Leechburg Mining Company's Park Mine, tests were made of Kennametal HFD 13/8-inch roof bits and other carbide bits of the same diameter. Using a Jeffrey A-7 Drill with shop-made rods and drilling rig, holes two feet deep were drilled into hard, brittle slate having a one-inch pebble streak.

Four holes were drilled with the other carbide bits under test before reconditioning was necessary. Under the same conditions, 14 holes were drilled with Kennametal before resharpening, reducing bit cost to 1/3 of what it was formerly.

Kennametal bits last longer because they're made better. They have shock and wear-resistance qualities superior to any other tungsten-carbide bits in the industry. Try them. Your bit costs will be less. You'll spend less time resharpening and changing. You'll drill more holes per man, per machine, per hour. Your Kennametal representative, a veteran having many years of mining experience, will help you put the right tool on the job. Call him, or write: KENNAMETAL INC., Mining Tool Division, Bedford, Pennsylvania.



#### National Mine Service appointed Kennametal dealer

Complete stocks of Kennametal mining tools are now available at all National Mine Service warehouses . . . Indiana and Forty-Fort, Pa., Beckley and Logan, W.Va., Jenkins and Madisonville, Ky. Kennametal service and sales personnel work with those of National Mine Service in giving tool performance demonstrations and reconditioning instructions and to help you in tool selection.



#### A third less manpower A third more drilling

Use of the Kennametal RD 15%-inch bit resulted in both easier drilling and lower drilling cost in an anthracite measure at Rogers Bros. Co., Scranton, Pa. Simply by changing to this bit, two men are now drilling 1/3 more each shift than previously drilled by three men in the same length of time.



#### New-Uranium prospector's drill

Kennametal recently introduced a carbide-tipped hand drill for uranium prospectors. This new tool stays sharp much longer than conventional drills, greatly reducing the load of drills to be carried into remote prospecting areas.









# Constant savings 9 ways!

- NON-STOP LOADING is permitted by the new revolutionary articulated design which eliminates space between cars.
- **2 NON-STOP DUMPING** is provided by **QCf** 's maintenance-free drop bottom cars.
- 3 NO SPILLAGE during loading or fast "runs".
- 4 NO WIDE "TURNOUTS" or extra timbering are needed because of reduced overhang.
- **5** LESS MAINTENANCE is required because special trucks, one set per two cars, eliminate flange wear and side play...assure perfect wheel alignment even on curves.
- 6 SHORTER TRAINS AND FEWER CARS are possible because no space is wasted between the long, extra-capacity cars.
- 7 SHUT DOWN PROOF operation is assured because a damaged car can be repaired while the rest of the trip goes on working.
- 8 TWO-WAY PAY LOADS: same trip can bring out the coal and take in supplies.
- 9 GREATER FLEXIBLITY: capacity of new type cars can be varied to meet your particular needs...later on, your entire haulage system can be easily modified to meet new demands of production.

articu-trip

ASK YOUR Q C f REPRESENTATIVE for complete information. American Car and Foundry, a division of Q C f Industries, Incorporated, New York • Chicago • St. Lous Cleveland • Philadelphia • Washington • San Francisco • Berwick, Pa. Huntington, W.Va.

acf for Constant Haulage

for short interval delay blasting

use

CONNECTORS

PLEASE SHOW THIS ADVERTISEMENT TO YOUR BLASTING

PRIMACORD

Better fragmentation, reduced vibration, controlled throw . . . these are some of the advantages obtainable with short interval delay firing. Primacord MS Connectors enable you to set up delays in your Primacord surface trunk lines.

The Connector consists of a copper tube about 23/4 inches long, containing an element which produces a delay measured in milliseconds. A piece of Primacord approximately 12 inches long is crimped in each end of the tube. The Primacord trunk line is cut, and the Connector is joined to the two ends with tight square knots. Or, the ends can be lapped to the main line and bound with electrician's tape. It will function equally well lying on the ground, suspended in the air, or covered with sand. In wet conditions the Connectors should be raised out of the water.

Like Primacord itself, the MS Connectors are not affected by stray electrical currents, and can be used whenever such currents might be encountered.

See your explosives supplier or write to

THE ENSIGN-BICKFORD COMPANY . Simsbury, Connecticut

Primacord, Quarrycord, Ignitacord, Safety Fuse, Blasting Accessories

Established 1836

Primocord trunk line and tie in the Primacord MS Connector using square knots drawn up tight.

PROVED AND APPROVED DETONATING FUSE

52

Devoted to the Operating, Technical and Business Problems
of the Coal-Mining Industry



SEPTEMBER, 1955

IVAN A. GIVEN, EDITOR

## **Unquestioned Progress**

THE GRAPEVINE has it that a major oil company on the East Coast took the recent advance in the price of residual as its cue to use the escape clause in its contract with certain major consumers, suggesting that said consumers would be better served by coal. The same grapevine also has it that other oil companies are discouraging new residual business on the score that residual will be both short and higher-priced, with some specifically urging the use of coal as the alternative. True, the instances are not numerous, but the fact that they have actually happened is reason for assuming that they can be made to happen more frequently in the future. This is one of the cheering developments accompanying steady progress in bituminous production and the recent development of considerable strength in the anthracite picture.

#### In the Bag

The bituminous industry, in fact, goes into the 1955-56 winter season with a good leg on a possible gain of 65 to 70 million tons—maybe more. Perhaps one should cross toes as well as fingers in prophesying increases of this magnitude, but they seem reasonable in view of the fact that the gain up to end of July—seven months—was nearly 45 million. At that time, production was running nearly 2 million a week ahead of 1954. It is doubtful if the average could drop to less than 1 million the rest of the year, so 65 million apparently is in the bag. And it could be more.

#### Strength Predominant

The conclusions reached in the preceding paragraph are borne out by looking at where coal might suffer further losses. Of course, if the economy should go to pot, all bets are off. Otherwise, coal still is losing at a relatively modest rate, relatively speaking, in the railroad field. Further drops are being reported in retail deliveries, but there is some question as to whether they are as great as published figures indicate. There also is some strong opinion that "Other Industrials" actually are taking considerably more tonnage than the statistics show. Summing up, therefore, the weaknesses in the picture are relatively less a factor than in previous years, while the strength is evidenced by the increased takings of industries that really chew up the tonnage.

#### More Btu's

What of 1956—and succeeding years? Is 600 million tons a year possible in 1960? Balancing possible losses against gains, the answer is "Yes!" The United States will be using at least 25% more Btu's in 1960, while the ability of oil and gas to supply the increase grows more doubtful day by day. Space prohibits citing chapter and verse here, but it is becoming increasingly apparent that oil competition has reached its peak and that natural gas is not far away.

#### Sooner Than Later

All this could be cold comfort if the atom should sweep the boards. But at least it can't do it by 1960, nor by 1965—if ever. So coal can look forward to a period of quite a few years during which competitive pressure will be less and the opportunity for cashing in on low cost, quality and research through better merchandising and engineering service will be significantly greater. Maybe it is time to think about the mining capacity that the new demand will require. It might be needed sooner rather than later.



COMPLETELY INTEGRATED PLANT includes mechanized mining for providing 7,500 tpd of coal from adjacent de-'posits. A company town also is being built for housing employees and their families.

## Oil From Coal—Full Scale

South Africa has world's first synthetic oil plant in commercial production. What the plant is like and why it was built.

By V. S. SWAMINATHAN London, England

ON THE BROAD, flat veld of the Union of South Africa, north of the lofty coastal mountains, and some 50 mi south of Johannesburg, the world's first large-scale, synthetic oil-from-coal plant has risen and gone into operation.

It is the new \$84,000,000 "Sasol" plant, located on a 5,000-acre site near Coalbrook, atop a vast supply of its raw material, coal. The plant lies on the Vaal River—the Union's major source of water—and within easy distance of its markets.

Abstracted from Petroleum Processing, a McGraw-Hill publication, July, 1955.

The word "Sasol" is derived from the firm's Afrikaans name, Suid-Afrikaanse Steenkool-Olie-en Gaskorporaisie Beperk. The English name is South African Coal, Oil & Gas Corp.

The process employed at Coalbrook consists of gasification of the coal, and then conversion of the gas into conventional petroleum products and chemicals, using both American and German versions of the Fischer-Tropsch reaction technique.

#### WHY SASOL WAS BUILT

The justification for building the Sasol oil-from-coal plant in the Union of South Africa and near Johannesburg was both strategic and economic.

From the strategic angle the installation is based on a native raw material. The economic justification rests mainly on two big factors: availability of thick seams of cheap coal at a shallow depth, and the existence of heavy freight charges for transporting refined petroleum products from coastal points to the Johannesburg area. Gasoline can be shipped from the Sasol plant to Johannesburg for less than 25% the cost of moving it in from the coast.

These natural strategic and economic advantages, coupled with the lack of domestic oil production and unattractive prospects for developing any, led the government to invest about \$84,000,000 in the Sasol installation.

When in full operation the Sasol plant is expected to effect a saving in foreign exchange of about \$19,600,-

000. This is from an annual production of about 55,000,000 imp. gal of gasoline and 16,000,000 imp. gal of other products, at a yearly product value of \$25,200,000.

#### MATERIALS, LABOR COSTS LOW

Low raw materials costs are an important factor in the economic justification for the Sasol installation. The plant site is on top of a huge coal field and along the banks of the Vaal River.

Sasol's mineral rights cover an area of some 13,560 acres, holding 665,000,000 tons of coal of which 300,000,000 tons are extractable. Mining at the rate of about 7,500 net tpd, Sasol has almost 110 yr supply of extractable coal.

Local mining costs compare very favorably with others. It costs Sasol 70¢ per ton to mine its coal. Costs in the United States range from \$2 to \$4 per net ton, and in Great Britain up to \$8.82 per ton. The average proximate analysis of this coal is:

Calorific value,

Btu per lb (gross)		 		.8,400
Ash content, %				
Volatile matter, %		 	*	. 23
Fixed carbon, %				
Moisture. %				

Low labor cost is a key factor. The company's own mine, the Sigma colliery, extracts the 7,500 tpd used by the plant with the latest mechanized equipment, a labor force of 350 surface and underground African workers, and a total European staff of 40. This is less than one-sixth the number of Africans and less than one-third the number of Europeans usually employed in a conventional South African colliery. Based on these figures, output per man per day comes to about 20 tons.

Extensive use is made of all types of mechanical equipment: mobile coal cutters, mechanical loaders, shuttle cars, belt feeders and a coneyvor belt system. The hydraulically-operated coal cutters are fitted with 9-ft cutter bars.

Included in the conveyor system to carry the coal to the surface after preliminary underground crushing are two of the longest conveyors built in the Union of South Africa. Each one is 3 ft wide by 3,200 ft long and is designed to move coal at 400 tph.

#### PLANT SECTIONS

A dozen main sections make up the complete Sasol plant:

- 1. Steam and power generation.
- Tonnage oxygen production.
   Gas producing and purification.
- 4. Catalyst preparation.
- 5. American-type synthesis plant

#### What Sasol Will Make and How Much

#### REFINERY PRODUCTS

Materials	Planned Production
Gasoline, bbl per day	4,300
Diesel oil, bbl per day	335
ruei oil, bbi per day	180
Faramin waxes, 105 to 240 F melt. pt., net ton per yr.	18,000
Liquefied petroleum gas, imp. gal per day	720
Pitch & tar road primers, imp. gal per day	2,685

#### **CHEMICAL PRODUCTS**

Materials	Production
Ethanol, imp. gal per yr	4,000,000
Propanol, imp. gal per yr	2.000,000
Butanol, imp. gal per yr	525,000
Acetone, imp. gal per yr	210,000
Methyl-ethyl-ketone, imp. gal per yr	260,000
Mixed solvents, imp. gal per yr	60,000
Benzene, imp. gal per yr	500.000
Toluene, imp. gal per yr	280,000
Xylene & solvent naphtha, imp. gal per yr	500,000
Creosote wood preservative, imp. gal per yr	1,000,000
Crude phenols, net tons per yr	6,000
Ammonium sulfate, net tons per yr	35,000

NOTE: Imperial gallon is one-fifth larger than the U. S. gallon.

with refining and preparation units (Kellogg).

6. German-type synthesis plant with refining and preparation units (Arge).

7. Methane gas reforming unit.

8. By-products plant.

9. Control house.

10. Tank farm and shipping facilities.

11. Cooling water plant.

12. Other auxiliary facilities.

In addition to the processing plant itself, the Coalbrook operation includes mechanized mining of the adjacent deposits to provide 7,500 tpd of coal, and establishment of a company town, Sasolburg, for housing employees and their families.

#### RAW MATERIAL NEEDS

The three major raw materials for the plant are coal, steam and oxygen. The total production of the synthesis gas—about 4,250,000 cu ft per hr—calls for 3,200 tpd of coal, 440,000 lb per hr of steam, and about 1,000,000 cu ft per hr of oxygen.

The coal used by Sasol is screened into three sizes. The two largest—1½x¾, and ¾x¾—are fed to the gasification plant, and the third size about ¾x¾—is fed to pulverizers which reduce it to powder for use in the steam generation plant.

The power plant consists of four 360,000-lb-per-hr boilers generating the steam required for the synthesis gas and other units, and three 13,-500-kw turbo-generators capable of

meeting all electrical power needs for the plant, the mine, etc.

Planned

The boilers operate at a pressure of 575 psi with an outlet steam temperature of 820 F. This high-pressure steam feeds to the coal gasification units, the turbo-generators, and to several plant sections where it serves as process steam and driving power for compressors, pumps and the like.

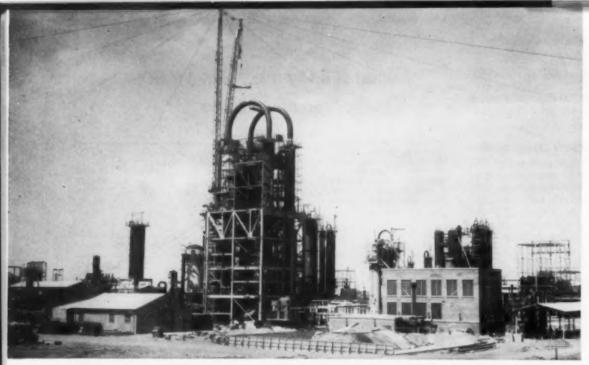
The oxygen plant consists of six identical Linde-type units, processing 9,000 tpd of air and producing 1,800 tpd of oxygen. The six turbine-driven centrifugal air compressors deliver close to 1,500,000 cu ft per hr of air at 75 psi to the Linde units. Three oxygen compressors deliver 0<sub>2</sub> to the gasification unit at 426 psi.

#### CONVERSION PROCESSES

Coal is gasified in nine Lurgi gas generators, under a pressure of 350 psi, by passing the oxygen and steam over it. This German "Rectisol" low-temperature extraction process (-40 to -60 C) achieves in one step what formerly required five stages: dry oil scrubbing, pressure absorption of CO<sub>2</sub>, removal of H<sub>2</sub>S, activated carbon scrubbing, and final hot purification over alkaline iron oxide to remove organic sulfur.

Ash removed from the coal by water sluicing is pumped to an ash dump. By-products of the gasification process are taken to the appropriate units for recovery of ammonia, phenols, tar, etc.

Purified synthesis gas, mainly CO



GAS SYNTHESIS UNIT, heart of Sasol plant, uses an American version of the Fischer-Tropsch process.

and H, is of a composition suitable for the subsequent catalytic reactions. Two streams emerge from the gasification unit. One is fed to the Kellogg (American) synthesis plant, which is the larger of the two; the other to the Arge (German) synthesis plant.

Catalyst for the Kellogg process is manufactured in the catalyst preparation section. Magnetic iron ore is fused and compounded with promoters, crushed to a fine powder, and reduced with hydrogen to yield the activated catalyst.

The Kellogg process converts the synthesis gas to hydrocarbons and oxygenated products by bringing the powdered catalyst into contact with the gas in two large reactors. The catalyst is then separated and the reaction products pass on to product recovery, where they are condensed and separated into the various products by relatively standard refining techniques.

German development of the Fischer-Tropsch process has deviated from American practice in that a fixed bed catalytic operation is preferred to the fluidized technique. However, iron has replaced the original cobalt catalyst used. In the Arge plant at Coalbrook, which is about a third the capacity of the Kellogg unit, catalyst is in the form of small pellets. Products are recovered in the same manner as those from the Kellogg unit.

Light hydrocarbons from the synthesis and recovery sections are reformed to synthesis gas and recirculated in the methane-reforming unit. This operation takes place in the presence of steam and oxygen over a nickel catalyst. In the by-products section,

ammonia, phenols, and other materials are extracted from the effluent of the gas generating plant, and the final effluent liquids are treated so as to be suitable for waste disposal in a conventional sewage plant.

#### SASOL PRODUCTS

A list of the conventional refinery products as well as the chemical materials to be made by Sasol is shown in the accompanying table. Storage facilities provide a total tankage capacity of 248,000 bbl of the various liquid products. Shipping facilities are available for loading rail and truck tankers, and for filling drums.

#### SALES, MARKETING POLICIES

Gasoline will be produced at a cost of around 16.3c per imp. gal (equivalent to the landed cost of imported gasoline), while the refinery selling price of about 25c per gal would give Sasol a profit of 8.7c per gal. No provision has been made in this calculation for profits on sales of by-products.

Sasol's competition would seem to be from two other operations in the general area. South African Torbanite & Refining Co. (Satmar) refines crude shale oil produced at Ermelo, 140 mi east of Johannesburg, producing about 300 bbl of gasoline per day. Secondly, the Stanvac plant at Durban, which went into operation early in 1954, has a daily throughput of 17,300 bbl. Stanvac obtains its crude from the Persian Gulf region.

Gasoline will not be sold only as a separate product according to Sasol's plans. About two-thirds of the total will be marketed through existing channels under an agreement with the four oil importing companies—Atlantic (whose marketing facilities in the region were purchased in 1954 by British Petroleum Co.), Caltex, Shell and Stanvac. The remaining third, along with Satmar's production, will be sold as a Sasol product.

As to the chemicals, the company's policy is not to extend the output beyond immediately salable products. It is hoping that private enterprise will undertake the establishment of an organic chemical industry in the Union of South Africa.

#### WHO MADE SASOL POSSIBLE

M. W. Kellogg Corp. engineered and supervised construction of the Sasol plant. Work on the project began in mid-1952. The Sigma colliery, providing the basic raw material, was brought into production on schedule, as was also the power station, oxygen plant and gasifiers. Final units were completed earlier this year and gasoline production began about April.

Sasol was financed through the Industrial Development Corp., to which the Union of South Africa government advanced the necessary funds. As of June 30, 1954, the company's share capital was \$70,000,000. Capital expenditures for the year ending that date were \$75,000,000. The main element in this outlay had been some \$33,600,000 in connection with the plant construction. Sasol, and Sasol Townships, Ltd., will eventually spend \$9,800,000 on township development and housing. Some 4,000 persons have been employed on the Sasol project.

## The Coal Commentator

#### **Extra Dividend**

An extra Coal Age dividend is coming your way later this month. It is "The 1955 Mining Guidebook and Buying Directory Issue," with which Coal Age is rounding out its regular twelve-months-a-year service in the fields of production, preparation, safety and related activities. Look for it in about two weeks.

News is the keynote of the regular issues of Coal Age, whether it be a new machine, an especially efficient mining operation, or a better means of promoting safety. Behind the news is a vast reservoir of mining practice and experience on which the new advances in mining are based, and thorough understanding and application of which leads to the maximum in efficiency, quality and safety. Summarizing that practice and experience, and showing how it can contribute to better results not only with new machines and techniques but with old as well, is the goal of "The Mining Guidebook." The aim is to answer questions and provide the basic information necessary in starting any improvement program, whether it be section-wide or mine-wide, and whether it is today or anytime in the months preceding the publication of the 1956 edition. There will be one a year to make sure that you are regularly brought up to date on machines, methods and mate-

Check "The Mining Guidebook" for ideas when you get it. Keep it to refer to when you encounter problems or start on new projects. Let it work for you.

#### Signs of the Times

Any good melting scrap lying around? One of the signs of the better times for the coal industry is the increased demand for metallurgical coal growing out of the brisk steel rate, which also generated increased demand for steel scrap. Now is a good time, perhaps, to think about cleaning up and selling out on scrap. By the same token, it is always a good time to think about salvage and reclamation of all mine items, and about a supply system that prevents waste and loss. Minimum expenditures for new material and maximum yield for scrap always is a good formula.

#### **Universal Goal**

It's no good if you can't take it someplace you can make use of it. It's no good, also, if you can take it someplace but it costs too much. Those are the basic reasons why coal transportation—from face to tipple and from tipple to point of consumption—is the object of so much thinking, experimentation and action these days, here and elsewhere.

Canada and Great Britain, among others, supply evidence of this preoccupation with transportation underground as well as from mine to market. In Canada, a Dosco affiliate, Old Sydney Collieries, Ltd., will put the first "cable belt" on the North American continent into slope operation this fall. It will be 3,800 ft long and will have a capacity of 750 tph. The belt is carried on wire ropes on each side which do the pulling. The conveyor was developed in Great Britian, which also has originated the "container-and-ram" idea for making platform cage hoisting automatic. And while the United States is perfecting overland pipe-line transportation of coal, Great Britain is adapting the U.S.-developed idea of hydraulic hoisting to handling coal. First tests on an 8-in vertical line in a 400-ft-deep shaft at Woodend colliery were made July 22. Design capacity is 350 tons of 21/2-in coal per hour, each ton requiring 12 tons of water to bring it out. One way or another, the coal industry everywhere is trying for low-cost haulage in and around the mines, and between mines and markets.

#### **Forerunner**

An unusual item, perhaps the forerunner of more and more to appear in the future as management and men learn to work together better for their welfare of their mines and their industry, occupied a spot on p 3 of the July issue of the Bell & Zoller Safetygram:

"Local Union Honors Herman E. Knight—On Saturday, May 28, 1955, Mr. Jake Crowell, on behalf of the members of Local Union 9566, of the Oriole mine, Madisonville, Ky., presented to Mr. Herman E. Knight, resigning general superintendent of our West Kentucky division, a Hamilton 21-jewel pocket watch inscribed on the back: '6-1-55—Best of luck to Herman E. Knight—Local Union 9566.' The local union presented the watch in recognition of the fine relationship enjoyed by the management and the members of the local union at Oriole mine."

Coming Event—Mr. Knight will present some of his ideas on mine management in a feature scheduled for an early issue.

#### **More Straws**

"Coal is cheaper," declared the United Taxpayers' League in opposing conversion of the boilers serving the Buffalo (N. Y.) city hall from anthracite to oil.

"An interesting by-product of this expansion is the emergence of coal as a major source of electric energy for aluminum production."—Richard S. Reynolds Jr., president, Reynolds Metals Co.



INDIANA JOINT SAFETY COMMITTEE at a regular monthly meeting discusses ways and means for keeping constant pressure behind safety drive. Conferees include labor, management, federal and state officials, insurance carriers.

## A 50% Reduction in Compensable

One fatality where previously there had been six . . .

A pre-Christmas month without a fatality or serious injury . . .



"Effective safety promotion calls for both education and action"—H. T. BATMAN, general manager, Lynch Coal Operators' Reciprocal Association.

By HAROLD DAVIS
Associate Editor, COAL AGE

THESE ARE MORE THAN DE-VOUT WISHES. They are solid safety achievements of men and supervisors representing about 90% of the employees and tonnage of the deepmining coal industry of the state of Indiana. Benefits like these have grown out of a joint assault on accidents by management, the union, state and federal mining officials and the operators' insurance carrier.

Here are some of the accomplish-

• Kings Station mine, Princeton Mining Co., Kings, Ind., in the 6 mo from December, 1954, through May, 1955, inclusive, has not suffered a compensable injury in producing 277,966 tons of coal.

 Viking mine, Viking Coal Corp., Terre Haute, Ind., has had only one compensable injury in the same period while producing 318,038 tons.

 Green Valley mine, Snow Hill Coal Corp., Terre Haute, experienced only two compensable injuries in this period while producing 515,462 tons.

Look at comparative figures provided by Lynch Coal Operators' Reciprocal Association on safety performance at Indiana's railroad-shipping deep mines in the Lynch group, as follows:

195 First 5 m	st First
Fatalities	6
Tons produced per compensable injury. 25,	644 61,21
Tons produced per lost-time injury 17,	270 24,64
Man-hr per com- pensable injury 18,	667 42,18
Man-hr per lost-time	
injury	572 16,98
tons1,692,	509 1,897,65
Exposure, man hr1,232,	036 1,307,74

This gratifying improvement in all categories indicates that the big safety story for this year is being written by the "deep" miners of Indiana.

How did it happen? Where did it start? How is interest aroused? Can

### Indiana Joint Committee for Coal Mine Safety

#### WHY IT EXISTS . . .

... although the tonnage produced in Indiana is small, frequency and severity rates were very high, in the opinion of Indiana coal men. It had come to be expected that one fatality per month would occur in a mining population of only 3,000 men.

. . . aggressive safety promotion was called for, and the committee was formed to assist in this work.

#### WHAT IT IS ...

... a group of representatives of the various mining interests, serving as a coordinating body for a continuous campaign of safety education and action.

. . . a regional set-up, recommended for use by

large companies operating several mines or in regions where a number of mines have similar safety problems and experience.

#### WHAT IT DOES . . .

... conducts a lively, year-round safety campaign, employing all applicable techniques and incentives.

. . . sponsors safety-training endeavors for mineworkers and supervisors.

 . . holds monthly meetings, open to interested visitors, where serious accidents are discussed and safety lessons based upon these accidents are planned.

. . . sets safety goals, makes plans for achieving these goals, then sets new ones.

## Mine Injuries . . .

More tons per compensable injury . . . Reduced frequency and severity rates . . .

others do likewise? The answers will be found in this field survey of Indiana's dynamic campaign which is a working testimonial to the value of education, action and teamwork in promoting safety.

### ORGANIZING A REGIONAL SAFETY COMMITTEE

The steering committee directing the effort consists of 11 hard-hitting advocates of safety, known as the Indiana Joint Committee for Coal Mine Safety, including by mutual agreement four representatives of UMWA, four from management (one must be a deep-mine superintendent), one from the U.S. Bureau of Mines, one from the Indiana Bureau of Mines and Mining, and one from Lynch Coal Operators' Reciprocal Association, the insurance carrier. A permanent secretary, ex officio, maintains an account of the committee's deliberations at monthly meetings which are held on the second Monday at Terre Haute and Vincennes alternately.



"We realize we have a big selling job to do . . . we'll not give up."— ROBERT ANDERSON, president, District 11, United Mine Workers of America.

The organization meeting was held at Terre Haute, Feb. 6, 1954, the minutes of the meeting showing that A. G. Gossard moved, and Robert Anderson seconded, the appointment of a committee of nine to serve as a hub of operations. On Feb. 23, the permanent committee was appointed as follows:

Howard T. Batman, general manager, Lynch Coal Operators' Reciprocal Association, chairman.

Robert Anderson, president, District 11, UMWA, vice chairman.

C. A. Purcell, director, Indiana Bureau of Mines and Mining, treasurer.
 A. G. Gossard, vice president, Snow Hill Coal Corp.

E. E. Quenon, health and safety supervisor, District E, USBM.

Charles Ferguson, safety director, UMWA.

George Enos, president, Enoco Collieries, Inc.

Ralph Day, secretary-treasurer, District 11, UMWA.

Placide Mayeur, general superintendent, Princeton Mining Co.

Later appointments to the committee included Louis Austin, international board member, District 11, and L. E. Briscoe, safety director, Fairview Collieries, Inc. John A. Stachura, general superintendent, Enoco Collieries, was appointed alternate to Mr. Enos, and Walter Gorby, vice president, District 11, alternate to Mr. Ferguson. William McCullough, safety engineer, Snow Hill, is secretary.



purpose.

erly utilized.



BULLETIN-BOARD POSTERS like these provide timely, hard-hitting safety reminders.

wards should be accorded those who

continuously demonstrate sincerity of

and posters should be fully and prop-

be recodified and brought up to date.

Within one year, these seven requirements and others had been car-

ried out and the benefits were begin-

5. Labor and management must

6. Accident - prevention literature

7. The Indiana mine laws should

build up noteworthy safety records.

The program began to crystallize at the first meeting. The secretary's minutes show that Mr. Ferguson, of UMWA, suggested a 7-point program which received acceptance. The seven points are:

 A continuous educational campaign should be conducted on the causes of all accidents occurring in the mines related to the program.

2. There must be no punitive provisions of any sort.

Accident-prevention and first-aid training should be an important part of the program.

4. Public recognition and other re-

ning to come in.

CONTINUOUS FLOW OF

SAFETY INCENTIVES

So much for history. The Joint Committee now operates as a "low-pressure" co-ordinator of all available safety incentives in building up a well-balanced system of safety reminders. Here are some of the safety incentives the committee has used to good advantage.

100% Training—Noting the benefits attained in other areas from Bureau of Mines accident-prevention training, the committee decided early to put its weight behind the promotion of this activity. The result is that more than 1,500 men have had the training during the 1954-55 training season, and seven mines have had 100% completion. Other mines now are in the process of training. The union is an indispensable recruiting agency in this training.

December Safety Campaign—The month of December historically shows more accidents than other months in many mining areas. The committee decided to take steps designed to correct this condition. This is what was done:

Each unit foreman conducted a short safety meeting with his crew each Monday in December at the beginning of the shift. He came to the meeting armed with a letter from the chief of one of the agencies interested in the campaign. On succeeding Mondays there were letters from Messrs. Batman, Anderson, Purcell and Quenon, all bearing down on the theme, "Spend Christmas at home, not in the hospital."

For example, Mr. Batman wrote: "This month of December brings much happiness to most homes, but to many it has brought sorrow... Be extra careful, look out for one



"This co-operation in safety has created a better feeling through all our relationships."—A. G. GOSSARD, vice president, Snow Hill Coal Corp.



"We look for even greater gains as we continue to train men."—E. E. QUEN-ON, district health and safety supervisor, U. S. Bureau of Mines.



LEO MARTIN, hoisting engineer, Green Valley Mine, Snow Hill Coal Corp., was awarded a watch for his winning slogan, shown on the poster. Contest applications were distributed as pay-envelope inserts.



COLVIN BURK, chief engineer, in charge of Viking mine, Viking Coal Corp., points out his company's improved performance this year on the type of poster distributed monthly to all mines participating in the program.

another, be alert at all times. We want a Merry Christmas and a Bright New Year for every family."

Mr. Anderson wrote: "Let each man make a committeeman of himself to work carefully so as to protect himself from all accidents, and also his buddies working around him."

Mr. Purcell wrote: "The real spirit of Christmas is measured by what we do for others. May I suggest that you look out for your buddies' safety, which will automatically make your own more secure."

Mr. Quenon in his letter expressed similar thoughts for the Bureau of Mines, stressing the importance of spending Christmas at home.

These letters are backed up by payenvelope inserts bearing the same message, and a poster, shown in an accompanying illustration, was executed and displayed at all mines. Its message: "Don't spend your White Christmas in a hospital." This poster is the work of Omar Seamon, a celebrated water-color artist and a native Hoosier.

From all indications, this multiple approach had the desired effect. There was not a single fatality nor serious injury during the month, setting a new high in safety experience for December.

Fully realizing the hazards of lending too much credence to the figures for a single month, the committee looks forward to a chance to duplicate the feat. In the meantime, a similar campaign was conducted in the weeks

immediately preceding the miners' vacation in June with similar praiseworthy results, thereby adding substance to the December achievement.

The thought underlying these campaigns is that a man may begin to think of other things as a holiday or vacation approaches. He needs to be constantly reminded of his responsibility for safety.

Accident Investigations and Pub-



"We're just beginning to realize the extent of the benefits"— C. A. PUR-CELL, director, Indiana Bureau of Mines and Mining.

licity—Safety engineers of the Lynch association conduct investigations of all serious accidents. A report is prepared on the findings and copies are posted on the bulletin boards at all mines. A sketch of the physical conditions relating to the accident is included. Thus, all employees at all mines learn of hazardous conditions or practices that have resulted in serious injury to a workman. Successive reports are prepared on paper of different colors to attract attention.

Slogan Contest—All employees were encouraged to participate in a slogan contest in which a banner line for the 1955 safety effort was to be selected. Entry blanks were inserted in pay envelopes, and response was gratifying. The winner, Leo Martin, hoisting engineer, Green Valley mine, Snow Hill Coal Corp., received a watch for his entry, "The best safety appliance in the world is a careful man." Attractive posters displaying the slogan have been posted at all mines.

Turkey Derby—Each employee at mines fulfilling prescribed safety requirements during the preceding year receives his choice of ham or turkey at Christmas. This is another safety incentive which can be promoted throughout the year. Promotional materials and safety discussions can be based upon the Turkey Derby all year long. This program is sponsored and underwritten by the Lynch association, although the safety records at the mines are a matter of direct concern to the joint committee.

Another noteworthy result of committee activities is a newly codified state mining law for Indiana, passed at the most recent session of the legislature and placed in effect on March 8, 1955. Members of the joint committee, representing all interested groups, updated the existing law and submitted their recommendations to legal experts for final drafting. The measure was presented to the legislature as an "agreed" bill, one which would not be opposed by mining spokesmen in committee hearings, thus demonstrating the degree of cooperation obtainable in the committee's deliberations.

The committee now is active in organizing Indiana's annual first-aid contest and in backing up the organization and training of a mine-rescue team, a project which has been taken on at Snow Hill's Green Valley mine.

Thus the Indiana Joint Committee for Coal Mine Safety continues to promote year-around interest in safety, using older tried-and-true methods as well as some sparkling new ideas.



NEW CLEANING FACILITIES mark Scott No. 4 as first commercial mine in Buckhannon area with total cleaning.

## New Belt Mine, Total Cleaning Strengthen Market Position

How Reppert Fairmont utilizes modern mining methods and effective management to get 18 tons per man on the payroll while producing 1,300 tpd. First "total cleaning" plant in area supplies customers with high-quality product.



COMPACT PLANT covered with aluminum siding has facilities on all tracks for either freezeproofing coal with calcium chloride or dustproofing with hot oil.

MODERN MINING METHODS, total cleaning and effective management are not confined to the large companies with the large mines. The Scott No. 4 mine of the Reppert Fairmont Coal Co., Clarksburg, W. Va., boasts a complete new modern plant for cleaning and sizing coal produced in a modern all-belt mine. With only 72 men on the payroll, Reppert's Scott No. 4 is producing 1,300 tpd. The new cleaning plant gives Reppert Fairmont the distinction of being the first and only commercial mine in the Buckhannon area of West Virginia with total cleaning facilities.

The Reppert Fairmont Company has been mining in the Fairmont area since 1926, early operations being in the Pittsburgh seam. The company is headed by Alfred R. Reppert, president, who has offices in Clarksburg, W. Va. Stephen E. Reppert is vice

president and general manager, is directly in charge of mining operations and headquarters at the mine, about 1 mi west of Buckhannon.

As the company's reserves of Pittsburgh seam dwindled, a search was started for additional reserves. Undeveloped tracts investigated weren't attractive; therefore the search was directed to the Redstone seam which showed more promise. Soon after, the company began putting together a 3,500-acre tract within 1 mi of Buckhannon. As soon as property was consolidated, plans were made to develop it into an all-belt modern mine.

The crushing and screening plant was completed early in 1953 and underground mining began in March. Early work was concentrated on driving five headings northward with off-track equipment, including a Joy 14-BU loader, 6-SC shuttle cars, 11-RU cutter and Schroeder handheld coal drill. This equipment worked two shifts expanding the new mine so that additional machines could be added when the company's mine in the Pittsburgh seam was exhausted.

Many clay veins were met soon after the mine was opened and, as a result, a great deal of coal was thrown away with the clay. In fact, so much coal was discarded that top management decided that a complete cleaning plant would pay in greater coal recovery and a cleaner, more uniform product.

On Jan. 1, 1954, a contract was let to Roberts & Schaefer to design and build a 150-tph cleaning plant including a Hydroseparator for coarse-coal cleaning and an Airflow table for fine-coal cleaning. Plant construction began in March, 1954, and early in July of that year it began cleaning the full production from Scott No. 4 mine.

Coinciding with the completion of the cleaning plant was the addition of the second underground mining unit. With the two sections operating on a double-shift schedule, mine output soon was brought up to 1,300 tpd. Coal from Scott No. 4 is sold exclusively by Reppert Coals, Inc., primarily to utility customers.

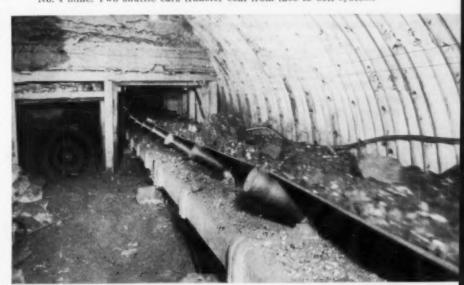
#### MINING CONDITIONS

The Redstone seam ranges in thickness from 40 to 54 in and averages 46 throughout most of the mine. A 20-in layer of sandy shale lies immediately over the coal and a hard sandstone forms the main roof. A hard fireclay provides a solid floor for off-track equipment.

The seam dips gently to the west but never more than 2%. Mine workings range from damp to dry on the advance and little pumping is neces-



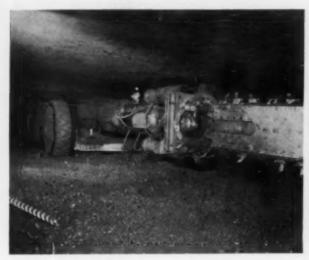
LOADER works steadily to keep coal flowing in 46-in Redstone seam at the Scott No. 4 mine. Two shuttle cars transfer coal from face to belt system.



ALL-BELT HAULAGE permits continuous coal flow from shuttle cars to steel storage bin on surface. Steel arch protects men and belt at portal.



DIESEL LOCOMOTIVE pulls nine 12-ton cars from mine portal to cleaning plant about 2 mi away. Loading, dumping and round trip take 30 to 40 min.



UNIVERSAL CUTTER operates at top efficiency, undercutting and shearing Redstone coal to a depth of 9 ft.



HYDRAULIC DRILL is used to bore blastholes with a minimum of effort. Unit features lightweight and safety.



EASY STOPPING of main belt conveyor is possible by touching control wires together at any point along belt.



STORAGE BIN at portal holds 100 tons of coal, provides surge capacity while coal is hauled to plant.

sary except in some pillar work. Numerous clay veins are present in some areas but sulphur balls occur infrequently and when they do are usually small. The coal is somewhat softer than the Pittsburgh seam in the same area.

#### HOW THE COAL IS MINED

Mining equipment includes two Joy 14-BU loaders, two 11-RU cutters with 9-ft bars, Bowdil chains and Carboloy bits; two 6-SC and two 42E shuttle cars; Schroeder handheld hydraulic coal drills with Coalmaster augers and Firth Sterling bits; and a Chicago-Pneumatic RBD 30 roof-bolter.

The initial five main headings were expanded into a nine-heading system, and all secondary-main and panel entries are projected for the same number of openings. Headings are driven on 50-ft centers and breakthroughs are cut on 80-ft centers. Where roof is supported by wood timber, headings are driven 25 ft wide; where bolting is practiced, 21 ft wide.

Coal is bottom cut to a depth of 9 ft and then sheared vertically about one-third in from the left rib. Four blastholes on 5-ft centers are drilled per cut in a 25-ft heading. Three or four holes, depending upon seam conditions, are required in 21-ft cuts. Coal is broken with du Pont permissible.

Two shuttle cars work with each loader and carry coal to a 30-in Joy belt conveyor set up in the No. 5, or middle, heading. Coal then moves in a continuous flow to the surface and is deposited in a 100-ton silo-type

steel bin. Rock also may be loaded onto the belt and diverted to a separate rock bin on the surface.

The 3,000-ft main-entry belt is powered by a 40-hp motor, and secondary belts are powered by 25-hp units. All of the underground conveyors are equipped with Raybestos-Manhattan belt. Special limit switches prevent two lateral belts from loading coal onto the same section of the main conveyor. For example, if an inby secondary belt discharges at full capacity onto the main carrier, any outby belt will be prevented from discharging on top of that portion of the belt that is fully loaded. As soon as the fully loaded section passes the stopped belt, the limit switch functions and permits the belt to start. All belts are equipped with sequence starting and have slippage controls.





PRESIDENT Alfred R. Reppert (left) guides activities at Reppert Fairmont. OPERATING OFFICIALS (right photo) Stephen E. Reppert (left), vice president and general manager; Otto Simmons, assistant foreman; George Decker, assistant foreman; Ronald Fuller, chief electrician, night shift; Glenn Coe, assistant foreman; Floyd Aliucci, superintendent; Willard Mace, chief electrician, first shift; and Woodrow Corley, assistant foreman.

The main belt also has an Ensigneer control that permits it to be stopped and started from any point along the line merely by touching two wires together. In an emergency the belt can be stopped instantly from any point along its length.

#### **BOLTING UPS PRODUCTION**

Roof normally is supported by straight posts set on 5-ft centers except in shuttle-car roadways. But when weak roof is encountered, roof-bolting has been used effectively to increase production and maintain it on a par with that in good-roof areas.

When bad roof was first met, shortly after the mine was opened, wood crossbars set on wood legs were used to support the roof. They cut down on the already limited head room and, as a result, movement of machinery was made more difficult. Consequently production suffered.

Soon after it became apparent that there would be areas needing heavier support, management decided to roof-bolt all development work. A Chicago Pneumatic RBD30 was assigned to the job of installing 30-in Pattin expansion-type bolts on 5½-ft centers.

Shortly after roof-bolting replaced conventional wood timbering in areas requiring heavy support, production increased 60 to 70 tons per shift, or about 25%. Equipment was able to move about faster and there was no longer danger of dislodging a crossbar. Output has been consistently well ahead of that when working under wood support. As a result of these gains, roof bolting has become the major method of supporting weak roof.

#### MAINTENANCE AND SERVICES

Maintenance of the underground equipment is handled by one mechanic on each production shift, and a mechanic and greaser on the third shift. Supplementing these regular mechanics are a second-shift shuttle-car operator in each section who also is a mechanic and does day-to-day repair work as needed.

Mine supplies currently are carried underground on the belt conveyors between shifts and on the third shift. As soon as the present mining area is worked out and the main entry is driven outside, a new portal will be made on Turkey Run. When the new opening is completed, a supply track will be laid to permit supplies to be hauled to the work areas in cars. As the new portal develops, men will be transported to the section in man-trip cars. Management expects the new portal and facilities to be ready for use within 9 mo to a year.

Two 200-kw General Electric rotary converters installed on the surface provide 270-v DC power to the mine equipment. Current is carried to within 1,000 ft of the face by 1 million-crimil copper feeders and returns. A 750,000-cir-mil circuit carries power the remaining 1,000 ft to the equipment.

#### HOW THE COAL IS CLEANED

The main-entry belt carries coal to the surface and elevates it to a 100-ton silo-type steel bin where it is stored temporarily. It then is transferred to 12-ton drop-bottom mine cars and hauled 10,800 ft to the preparation plant, which is centrally located to serve future portals that are planned

for other parts of the Reppert mine.

A 15-ton Brookville locomotive powered by an International diesel engine shuttles back and forth between the mine and cleaning plant. Handling nine cars containing about 100 tons of coal, the unit makes a round trip in 30 to 40 min, including loading at the mine and dumping into a 100-ton bin at the cleaning plant.

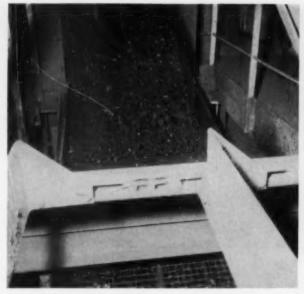
The raw coal is fed to a shaking picking table where it is separated into plus 2 in and 2x0 sizes. One man removes wood and large pieces of slate from the larger size before it passes to a McLanahan & Stone single-roll crusher for reduction to 5x0.

A scraper conveyor then lifts the combined raw sizes to the washing section of the plant and deposits it on a 6x16-ft Allis-Chalmers Ripl-Flo vibrator for separation into 5x1¼, 1¼x½ and ½x0 fractions. The 5x1¼ and the 1¼x½ flow to separate compartments of the Hydroseparator and the ½x0 passes to a fine-coal storage bin.

#### COARSE-COAL CLEANING

Each compartment of the Hydroseparator has two cells, primary separation being made in the first cell and near-gravity material being removed in the second. The sink material in the second cell may be separated at 2 in on a bar screen and the larger size recirculated, or both sizes may be recirculated or sent to refuse.

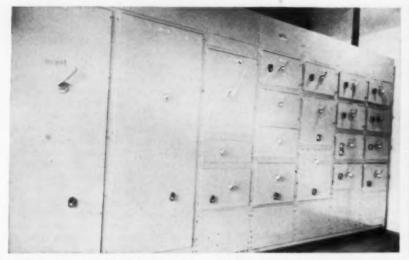
Clean products from the Hydroseparator flow to a 5x10-ft triple-deck Allis-Chalmers dewatering and sizing screen for separation into 5x2 or 5x14, 2x4 or 14x4, and 4x½ fractions. These products are discharged into chutes fitted with fly gates that permit



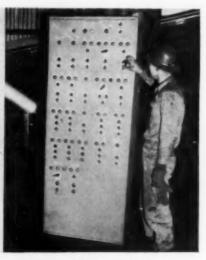
COARSE-COAL CLEANING is done in two-compartment unit that discharges clean products to sizing vibrator.



AIR TABLE removes impurities from the \( \frac{1}{2} \)x0 raw coal in three draws and leaves a clean, dry uniform product.



ELECTRICAL CONTROLS for all preparation units at Reppert Fairmont's Scott No. 4 are housed in separate dusttight room covered with asbestos sheeting.



CENTRAL BOARD permits one man to operate all equipment by push buttons.

coal to be directed either to loading booms or to a two-compartment conveyor for further reduction by a twostage Gundlach crusher to any size down to 3x0. The two-compartment conveyor also permits either one of the sizes to be crushed or loaded without reduction.

#### FINE-COAL CLEANING

The raw ½x0 drops from the storage bin into an Airflow table from which three draws are made. The first draw is refuse and passes directly to the refuse conveyor. The second draw is middlings and can be recirculated or directed to refuse, but usually is reprocessed. The last draw is middlings and is always recirculated. Clean ½x0 is discharged onto an Allis-Chalmers vibrator which removes the 10Mx0 if desired. The coal then flows to railroad cars. Dust from the tabling process is collected in a cyclone and mixed with the clean coal or diverted to refuse as occasion demands.

Facilities are included in the plant to permit freezeproofing of the coal with Morton No. 5 salt and dustproofing with hot oil. A Viking hot-oil system delivers Ashland oil to all loading tracks where flow of oil to each track may be controlled individually.

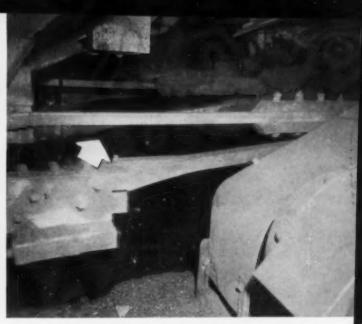
Plant units, which are driven through Falk speed reducers by Westinghouse motors, are controlled from a Cutler Hammer central push-button panel board. Starters and circuit breakers are housed in a dustproof room covered with asbestos sheeting.

Operation of the preparation plant is assigned to a five-man crew made up of the following men: 1 operator; 1 hand picker; 1 car trimmer; 1 greaser and mechanic who also drops cars and drives a truck; and 1 foreman.

Mine supervisors in charge of the mining and preparing of coal from Scott No. 4 are Floyd Aliucci, superintendent; Willard Mace, first-shift chief electrician; Merle Newlon, preparation foreman; Ronald Fuller, second-shift chief electrician; Richard Greathouse, second-shift preparation foreman; Woodrow Corley, George Decker, Glen Coe and Otto Simmons, section foremen.



PLASTIC SPRINGBOARDS for shaking screens promote economy and efficiency at Dorrance by eliminating delays.



SHAKER DRIVE ARMS are another application for the fabric-and-resin boards, providing straightline screen action.

#### Using Plastic Springboards

PLAIN WOOD BOARDS have a characteristic whip action which makes them almost indispensable as supports for shaking screens in coal preparation plants. New developments in other coal-production practices constantly render former practices obsolete, but it seems that the old wood springboards go on and on. That is, until Lehigh Valley Coal Co., Kingston, Pa., found out it is possible to do a much better job by using springboards made of "Micarta," the thermosetting plastic made of fabric and synthetic resins by Westinghouse Electric Corp.

Lehigh Valley finds that the switch to Micarta has practically eliminated screen delays resulting from broken springboards, and it is the delays, not the boards, that run up the costs of operation.

#### HOW THE COMPANY VIEWS THE PROBLEM

The accompanying photos were taken at Dorrance colliery, Wilkes-Barre, Pa., the largest preparation plant now operated by Lehigh Valley. Input is about 7,000 tons of raw material in the 7¼-hr shift. In a situation like this, a surge bin capable of straddling even a short delay would have to be of absurd proportions. The emphasis naturally is on eliminating the delays, and that's where the plastic springboards stand out.

Three advantages of Micarta in this application are (1) it lasts longer, (2) it is dimensionally stable and (3) it

promotes better screen action. Taking them one at a time, here's how these advantages turn to the company's benefit

Longer Lasting-Lehigh Valley has no data on the ultimate life of the plastic boards since none have yet broken down. Some now in use on a high-speed screen which dewaters the clean coal from a Hydrotator have been in service 4 yr, originally at Prospect colliery for 2 yr and now at Dorrance. The cost of labor for installing replacement boards has been eliminated, the threat of having a collapse in an upper deck of a multiple shaker tear up the lower decks has been removed and screening delays have been virtually elimnated from the production cycle, as

Dimensionally Stable—Wood swells when it is wet and shrinks when dry. Wood springboards dried out during every idle period, with the natural result that the bolt holes through the boards became enlarged, thus accelerating the wearing process. Furthermore, changes in length of the boards after installation were not unknown. Micarta, on the other hand, is impervious to moisture, holds its original dimensions and possesses the required flexibility.

Promotes Better Screening—The contribution of Micarta to better screening is a reflection of its dimensional stability. The absence of warping and firmness of the fastenings insure straightline screen action to a

greater degree than when wood springboards are used. The result is that bearings and eccentrics and other parts of the drive mechanism require less maintenance. Now the shaker drive arms are being made of Micarta at Dorrance.

#### HOW THE PLASTIC BOARDS ARE PURCHASED

Lehigh Valley converts one screen per month to Micarta suspension. On this schedule the regular plant maintenance crew in one shift can line up the shaker, install the new boards and have the unit ready to operate, and the costs for conversion material and labor are spread out.

Boards for the main shaker are 8 in wide and ¾ in thick and up to 103 in long. For high-speed shakers, employing bottom suspension, boards are ½x6 in. Lehigh Valley specifies Grade G-262 in purchasing its Micarta, which is furnished cut to size but not drilled for bolting.

A recent price for a %x8x103-in Micarta board was \$58, but the company feels that this higher initial cost is more than recovered in a relatively short time through reduced maintenance, fewer delays and savings in labor.

Operating officials at Lehigh Valley are H. B. Wickey, vice president in charge of operations, and T. C. Price, general superintendent. Toby Eichler is mechanical engineer, and Harold Hontz, master mechanic. John Burns is preparation foreman at Dorrance.



SYSTEMATIC approach to maintenance is stressed in Consol's supervisor training program. Men are taught to use schematic diagram to find trouble.



MAINTENANCE MAN Clarence D. Flanigan traces circuit in diagram.

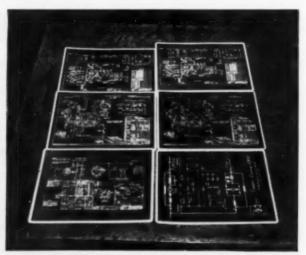




ATTENTIVE CLASS follows blueprints while Robert Quenon traces out trouble in the test panelboard. The test board (right) is used to set up typical underground electrical troubles. Lights represent shuttle-car motors.



MAINTENANCE PLANNERS at Owings No. 32 include E. L. McCoy (left), maintenance foreman; Samuel Pellerite, electrical engineer; and H. T. Kelly, superintendent.



WIRING DIAGRAMS printed on grease- and waterproof material are given to foremen and mechanics for use underground. They also are valuable class aids.



CLASS GETS UNDER WAY as Mr. Pellerite points out typical electrical troubles on electrical diagram and then has class explain how they affect the machine.

#### How Consol's Mine 32 Gains Less Down Time, Lower Costs, More Output From

#### Supervisor Maintenance Training

By A. E. FLOWERS
Associate Editor, COAL AGE

LESS DOWN TIME, better crew performance, lower mining costs and better supervision are top benefits resulting from maintenance training at the Owings No. 32 mine of the Consolidation Coal Co. (W. Va.). Started in 1953 as a voluntary program to train section foremen, the training recently has successfully completed its second

"We get our equipment back on the road quicker. We know how to look for trouble, how to trace it out. All of our effort is directed to getting the equipment back in operation. Before we knew anything about maintenance, all we could do was tell the mechanic to fix it as fast as possible. We are better men because we know more about our equipment and how to keep it running." These are words spoken by some of the men who took part in Consol's voluntary training program for foremen at Owings. To date, over 70% of the foremen and mechanics have taken the course and found it worthwhile.

#### HOW THE TRAINING

Cutting costs has become more important around coal mines in recent years and maintenance in particular has become a big factor in cost control at the mine. Consol's management be-

lieved that significant savings could be had if section foremen had a better appreciation of the care of mining equipment. If maintenance could be improved, equipment performance could be improved and costs could be lowered correspondingly. That was how the company reasoned.

Training foremen to recognize equipment trouble and correct it before a major breakdown occurs offered one of the best approaches to cutting costs. To be successful, management believed that participation in any training program should be voluntary—men must want the training. Therefore, the company decided to offer maintenance training to the foremen as an opportunity to learn and to become better or more valuable employees because of increased skill.

To get the ball rolling, Sam Pellerite, electrical engineer, was called on to teach the course. His first assignment was to enroll in West Virginia University's 6-wk extension course in mine maintenance. Getting ideas on teaching techniques and visual aids was his goal in taking the course. Included in the training were such subjects as electrical drawing for mining applications, physics, hydraulics and general maintenance of mining equipment.

After completing the course, Mr. Pellerite developed an outline for maintenance training at Consol, combining features of the university course with the specific needs of the mine. The next step was getting the foremen interested in taking the course and then

setting up the schedule for the classes.

The proposed course was explained to the bosses with special emphasis on how they could benefit from such a course. Offered purely on a voluntary basis, the training program was set up as an opportunity for the men to add to their skills and thus become more valuable workers. Mine mechanics also were invited to attend the classes if they so desired. Better than 70% of the foremen and mechanics responded to the invitation and soon the classes were under way. To assure maximum attendance with a minimum of inconvenience, classes were held at the mine office. Second-shift men met before work time and day workers gathered after the end of their shift.

#### WHAT IS TAUGHT

To help the men understand and appreciate the problems of electrical maintenance, they first were drilled in the fundamentals of electricity. Such topics as Ohm's law, metering, wiring, magnetism, AC and DC principles, DC mine circuits and Lenz's law were covered. With this as a foundation, the men next were schooled in applied maintenance procedures.

Since mercury tubes are an important part of the electrical controls in most of Consol's mining equipment, they were studied immediately after the men were well grounded in the fundamentals. Such topics as design of mercury-tube contactors, construction of mercury tubes, how time delay

is achieved and how magnetism oper-



DAYSHIFT CLASS-Front row: Samuel Pellerite, electrical engineer and instructor; Orval Clark, section foreman; Lowell Kelly, section foreman; G. S. Phillips, mechanic; T. L. Starkey, construction foreman; and Virgil Mackey, section foreman, Second row: James F. Kincell, mechanic; Robert H. Quenon, assistant superintendent; James McCray, mechanic; Harry Turner, mine foreman: Robert Elyette, section foreman; and Andrew Shuster, section foreman.

#### Here Is a Typical Test—How Will You Do?

#### **EXAMINATION NO. 1**

- 1. (T) (F)-On the 10-SC, a bad P2 mercury tube that will not open will cause the traction motor to run only in parallel.
- 2. (T) (F)-On the 10-SC, a bad M1 mercury tube will keep the shuttle car from running at any time.
- 3. (T) (F)—On the 10-SC, if wire #11 does not make contact with the transfer switch, the traction motors will run in parallel only.
- 4. (T) (F)-On the 10-SC, a bad S11 time-delay mercury tube will make the conveyor motors run in series only.
- 5. (T) (F)-On the 10-SC, a bad P1 coil will make only one traction motor run in parallel.
- 6. (T) (F)-On the 5-SC, a bad aR coil will make the traction motors run only in series in the reverse direction.
- 7. (T) (F)-On the 5-SC, a bad S coil will make the traction motors run in parallel only.
- 8. (T) (F)-On the 11-BU, if we do not have lights, the loader will not run.
- 9. (T) (F)-On the 11-BU, a bad 12M coil will make the main motor start with only part of the starting resistance.
- 10. (T) (F)-On the 11-BU, a bad 300 Ohm resistor will make the loader tele-
- 11. If none of the 10-SC traction motors run in series and only one in parallel, which of the following are bad:
  - 1. S1 coil

- 4. A bad traction motor
- 2. S1 contact
- 5. Poor P1 or P2 contact
- 3. P1 mercury tube
- 12. If both 10-SC traction motors run in series and only one runs in parallel, the following is wrong:
  - 1. A bad forward or reversing
- 3. A bad P1 or P2 contact 4. A bad motor
- contactor
- 2. A bad P2 mercury tube
- 5. A bad M2 coil
- 13. If the 10-SC shuttle car will not run, the following things are wrong:
  - 1. A bad fuse
- 4. A bad cable
- 2. A bad overload mercury
- 5. A bad M2 coil
- 3. A bad reset switch
- 14. If the 11-BU does not run on resistance but after three seconds it will start across the line, we have a bad
  - 1. 11M coil

- 4. A bad 11M contact
- 2. 12M contact
- 3. A bad resistance
- 5. A bad #6 interlock
- 15. On the 5-SC, if the traction motors run OK in one direction but only run in series in the other direction, we have
  - 1. A bad foot switch
- 3. A bad A2F contact 4. A bad 11L coil
- 2. A bad time delay mercury
- 5. A bad P1 mercury tube

ates the various types of mercury tubes were discussed. Symbols for all types of contacts also were explained and taught to the group.

Attention next was focused on schematic wiring diagrams and how they can be used to speed maintenance. The men were told that a wiring diagram is a maintenance "bible" and that without it the maintenance man is lost. All the commonly used symbols in mining-equipment diagrams were explained to the men and they were taught how symbols are used in wiring diagrams.

Starting with a simple diagram including only one or two time delays, the men were advanced through more complex circuits. At the end of this stage of the training program, the men were using the manufacturers' diagrams for shuttle cars, loaders, cutters and timbering machines.

After learning how to read the schematic diagrams, the class was taught how to trace or isolate trouble in one part of the circuit and then check items in that section. The men also were taught to check those parts of the circuit that were most likely to fail

About this time a demonstration and test panel board was built to be used as a teaching aid. Electric lights were connected in the circuit to represent the motors on the mining equipment and provisions were made to permit setting up typical electrical faults in the panel board. The trainees then were taught to follow the electrical circuit in the test panel, isolate the trouble and then explain how to correct it. This type of instruction gave the men confidence in their ability to trace faults underground at the face. As a result, they were able to help the mechanic get equipment back in service rather than standing by, not knowing what was wrong or how it might be fixed.

About 75% of the class time was spent on shuttle-car panelboards as they were the chief source of trouble underground at No. 32 and also had the most complex circuits. At the start of each class, the men were asked to bring up any problem encountered during the previous week and discuss them for the class. Thus all the men shared experiences and gained practical knowledge.

At various times, Mr. Pellerite would go back over some circuit that had been previously studied and ask about

ANSWERS, TEST 1-1., F; 2., F; 3. F; 4., T; 5., F; 6., F; 7., T; 8., F; 9., F; 10., T; 11., 4; 12., 2,3; 13., 1,2,3,4,5; 14., 3; 15., 2,

problems encountered underground. This technique served as a refresher for the men and, as new types of problems were met and discussed, their knowledge was broadened.

#### WHAT THE GAINS ARE

The results and benefits of the training program are not something that Consol measures only in terms of dollars and cents. They are reflected more in a number of other ways that are not always easily expressed in terms of money. For example, there is better co-operation between foremen and mechanics; major breakdowns are prevented since equipment is stopped and repaired before it fails completely. When a failure does take place there is less down time because the foreman and mechanic work with the wiring diagram and all effort is spent on fixing the machine rather than "shooting in the dark." Fewer parts are needed since machinery normally is stopped before a major breakdown takes place. All of these have added up to more production per shift.

The word has spread to other mines that a good maintenance-training program is in effect at Owings and already the superintendent of No. 93 has asked that similar training be started there. Organization plans already are under way and training will be started in the near future.

Now that the training program has been tried and proven, management looks forward to having all mines voluntarily participating in the program.

In addition to training supervisors, the program has been helpful in developing new mine maintenance men. Workers with an interest in maintenance work have been invited to participate in the course so they could get started on the right foot. Management does not expect all men who express an interest in maintenance and take part in the training program to become mine mechanics. But the company does believe that those who have the ability, coupled with the desire to learn good maintenance procedures, will develop into good maintenance men much faster if they take the course. In the period the training has been given, management reports that results have been encouraging with the new maintenance men developed from the training program. As they take part in more training classes and gain more experience at the face, management expects them to develop into first-rate maintenance men.

ANSWERS, TEST 2-1., F; 2., F; 3., T; 4., T; 5., F; 6., T; 7., T; 8., F; 9., T; 10., F; 11., 2; 12., 2; 13., 2,3; 14., 4.



NIGHTSHIFT CLASS-Front row: Mr. Pellerite; Charles Springston, mechanic; Oscar Davis, mechanic; Charles Witt, section foreman; John Knoble, section foreman; and James Germondo, section foreman. Second row: Dixie Flanigan, mechanic; Joseph Akers, shift foreman; Harold Huffman, mechanic; James Lester, section foreman; and Lewis Akers, section foreman.

#### Try This Test, Too—Check Answers Below

#### **EXAMINATION NO. 2**

- 1. (T) (F)-If the pump motor on the 10-SC does not run but the conveyor motors do run, we have a bad overload #1 mercury tube.
- 2. (T) (F)-If we have a bad P12 mercury tube that will not close, the 10-SC conveyor motors will run only in parallel.
- 3. (T) (F)-If S1 contact is bad the 10-SC traction motors will run in parallel
- 4. (T) (F)-If we have a bad S1 coil the 10-SC traction motors will not run.
- 5. (T) (F)-If mercury tube P2 will not open the 10-SC traction motors will run in series only.
- 6. (T) (F)-If P11 coil is bad, the 10-SC conveyor motors will telegraph.
- 7. (T) (F)-If S coil is bad, the 5-SC traction motors will run in parallel only.
- 8. (T) (F)-If we have a bad 12N coil which is open, the 11-BU loader will telegraph.
- 9. (T) (F)-If we have a bad M time-delay mercury tube the 10-RU tramming motor will run on resistance.
- 10. (T) (F)-The 10-RU will not tram if we have a bad 6R coil.
- 11. On the 5-SC, if the traction motors run OK in one direction only but run in series in the other direction, we have a bad
  - 1. Foot switch
- 4. 11L coil
- 2. Time delay tube
- 5. Pl mercury tube
- 3. A2F contact
- 12. If the 11-BU does not run on resistance but after 11/2 seconds it will start on part resistance, we have a bad
  - 1. 11M coil

- 4. 11M contact
- 2. Resistance 3. 12M contact
- 5. #6 interlock
- 13. If both 10-SC traction motors run in series and only one runs in parallel, the following is wrong 1. A bad forward or reversing
  - 3. A bad P1 or P2 contact

- 4. A bad motor
- 2. A bad P2 mercury tube
- 5. A bad M2 coil
- 14. If the tramming motor does not run on the 10-RU but the cutting motor runs OK, we have a bad
  - 1. AB breaker
- 4. M coil
- 2. 6R coil 3. 6R contact
- 5. 1A coil



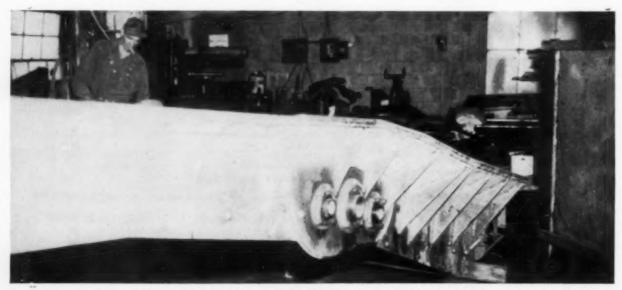


A LOW RAMP FOR THE SHUTTLE CAR and a minimum of top clearance are the only extras in setting up this shopmade, self-propelled pit-car loader, which can be moved 120 ft to next loading point and set up to work in 30 min.

#### Low Pit-Car Loader Increases

Officials at Viking mine designed their own elevating mine-car loader to get the 45-in tramming height they needed. The benefits are lower-cost loading points, faster move-ups, shorter shuttle-car hauls and steady, high-level production in entry development.

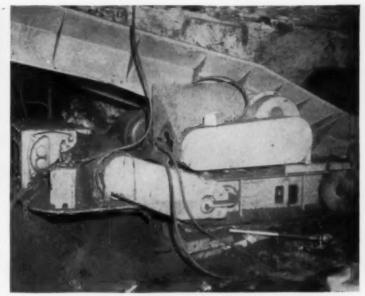
SUBSTANTIAL SAVINGS IN REAL MONEY are being realized at Viking mine, Viking Coal Corp., Terre Haute, Ind., as the result of development at the mine of a low-seam pit-car loader for transferring coal from shuttle cars into 3½-ton mine cars. Only 45 in high in tramming position, the new unit is employed in entry-development work where frequent advances of the loading point are necessary.



ALL-WELDED BODY of loader nears completion. This assembly is bearing-mounted on conveyor drive shaft to permit boom to be lowered for minimum tramming height. Maximum height of the machine then is only 45 in.



STANDARD PARTS, such as this shuttle-car conveyor, are used for easier maintenance.



TRAMMING MOTORS or conveyor drive motor may be plugged into single starter separately for selective operation.

#### Viking Operating Efficiency

Move-ups are scheduled at 120-ft intervals, the distance advanced in 3 or 4 days' work in 6 parallel openings. A full description of Viking appears in *Coal Age*. June, 1955, p. 60.

pears in Coal Age, June, 1955, p 60.

Conceived and designed by mine officials, particularly Colvin B. Burk, chief engineer in charge of the property; Ray Biggs, electrical engineer; and Harry Cruikshank, master mechanic, the loader consists of an elevating conveyor mounted on a T-2 mining-machine truck. Only a bare minimum of roof must be shot down to provide headroom at the loading points, and the only other preparation required is the construction of a low ramp for the shuttle cars at the feed end of the pit car loader.

A new loading point is constructed in the normal course of development work after each 120-ft advance. Then the loader is prepared for tramming, brought forward under its own power to the new location and resumes operation, all within 30 min.

As shown in the photos, the pit-car loader consists of a shop-made pan fitted with a chain-and-flight conveyor like that used on a Joy 6-SC shuttle car. The conveyor assembly then is mounted on a pedestal attached to the T-2 truck, and rotates on the pedestal shaft to a horizontal position for tramming.

Chain speed is 160 fpm, about three times as fast as the shuttle-car conveyor, thus stringing out the deep load discharged from the car and eliminating a need for surge space in the pit-car loader.

The conveyor chain is driven by a 15-hp Louis Allis motor which is independent of the original tramming motors, one for each track. The conveyor motor is powered through the Joy Magnetax control box of the truck by means of a special arrangement. Both the tramming motors and the conveyor-drive motor are equipped with Joy 4-conductor plugs, and either motor circuit may be plugged into the Magnetax control. A set of mercury switches was the only addition to the Magnetax control to permit resistance starting of the conveyor-drive motor, and push buttons are provided for remote operation. This system of using the tram or conveyor motors selectively makes it unnecessary to buy one control box.

The conveyor pan is made of 4-in steel plate from patterns worked out by Viking officials and engineers. All mechanical parts are standard commercial offerings, including Joy conveyor parts as mentioned, Falk speed reducer and Type FT Steelflex clutch, and Stephens-Adamson and Link-Belt bearings.

Here is how the new unit pays off handsomely, often saving up to \$400 per loading point in labor for making headroom and building a ramp, and in costs of handling material from the roof. In previous practice, it was necessary to remove from 10 to 14 cars of roof rock in the entry and breakthrough where a loading point was to be located. Then a steel pin and plank retaining wall was built to make a trackside dam for a dirt ramp, which was necessary to raise the shuttle cars to mine-car loading level. Sometimes the roof would continue to spall after the required headroom had been provided, adding to the complications.

In any event, the roof at these loading points had to be bolted twice, once as the entries were driven and again in the cavity after the roof rock had been taken down. All these hindrances made it extremely difficult to have loading points prepared on any sort of schedule. Often they were almost useless by the time they were finished because the entries had been advanced so far ahead.

Now the roof cavities are made every 120 ft by the development crew as part of their cycle. The cavity is bolted immediately and the low ramp is made for the shuttle cars. The major benefit is that shuttle-car haulage distance now is under control and production consequently is increased.

Two bolts hold down the receiving end of the conveyor while the pit-car loader is working. These are removed when the unit must be trammed to the next loading point, and the discharge end is lowered and held down by a pair of chains.



FATHERING ALL-REGISTERED ANGUS HERD of the Pittsburg & Midway Coal Mining Co. are Eileenmere 1204 (left), shown by Jay Cowan, P & M Angus farm manager; Prince Sunbeam 719, shown by William A. Wishart, super-intendent of all P & M farms; and, not shown, Prince Eric PM.

#### Strip Grazing For Prize Angus

Strip-land pastures in southeastern Kansas graze 500 head of top quality Angus and Hereford cattle, show that both registered and commercial stock can be raised profitably. Five thousand acre reclamation program has become agricultural asset to community.



H. H. SPENCER, P & M's board chairman, has been a breeder of registered Aberdeen Angus for over 12 yr. He started Angus project 3 yr ago.

By F. J. FORESMAN
Director of Industrial Relations
The Pittsburg & Midway
Coal Mining Co.
Pittsburg, Kan.

FLYING OVER southeastern Kansas, a casual observer might look down and see what appears to be large, uniform blocks of bituminous coal scattered over strip banks. However, a closer look would disclose the black objects to be registered Aberdeen Angus cattle, the breeding of which is the latest reclamation project of the Pittsburg & Midway Coal Mining Co., Pittsburg, Kan. Previously, only commercial Hereford cattle had been produced, but experience with the new project has shown that strip land can be used to produce fine registered cattle.

The casual observer was right in one respect—only a few years ago giant excavating machinery moved this land to make possible the recovery of thin seams of high-grade bituminous coal not recoverable by other mining methods. Now a total of about 500 head of Angus and Hereford cattle fatten on strip-mined



VIRILE GROWTH of sweet clover and Korean lespedeza gives rich pasture. Until maternity corral was provided, growth on P & M Angus Farm was so thick that calves were difficult to find. Jay Cowan, farm manager, holds newborn Angus calf found hidden in clover.

#### Formula For Successful Breeding on Reclaimed Strip Lands:



LARGE GRAZING AREA is a feature of 1,660-acre P & M Angus Farm. The area is fenced and cross-fenced so that cattle can be moved from one section to another to prevent overgrazing.



WELL-PLANNED FACILITIES, important for proper care of cattle, include 450-ton silo and large barn for hay storage and cattle shelter. Homestead may be seen in the background.



BULL JUDGING CLASS is under way at Southeast Kansas Aberdeen Angus Association Field Day. Such activities, the company feels, help to encourage the breeding of registered cattle.



THE CHEROKEE COUNTY 4-H CLUB sponsors the annual Angus field day and judging school, held this year at the P & M Angus Farm. Girls shown helped serve lunch prepared by the club council.

land developed into pasture through the seeding of sweet clover and "Korean" lespedeza. Over 5,000 acres have been developed by the Pittsburg & Midway Coal Mining Co. through a reclamation program which has become an integral part of its mining operations.

The Angus project was started May 1, 1952, by H. H. Spencer, P & M's board chairman. He has been a breeder of registered Aberdeen Angus for over 12 yr. William A. Wishart, farms superintendent, a graduate of the Kansas State College of Agriculture, supervises the project along with the company's other farm-

ing and reclamation activities which embrace over 17,000 acres of company-owned land. Assisting him is Jay Cowan, farm manager, who resides on the Angus farm. Both men work under the general supervision of Mr. Spencer and Edwin R. Phelps, vice president in charge of operations.

#### HERD GROWTH

The initial Angus herd consisted of 20 head of bred heifers and 1 herd bull. The selection was made personally by Mr. Spencer who attended a large number of sales to obtain the quality of stock desired. The heifers were purchased at consignment sales held on recognized farms in Missouri, Iowa, Kansas, Oklahoma, Kentucky, New York, New Jersey, Illinois and Ohio. The first herd bull, Prince Sunbeam 719, was purchased from the Sunbeam Farms, Miami, Okla., and is the grandson of Prince Sunbeam 29.

The present herd consistes of 90 head of breeding-age females, 3 herd bulls, and 60 calves and yearlings. Twenty-five head of cattle have been sold at consignment sales for prices considerably above average. With the exception of one bull and a few breeding-age females, all of the increase has been produced from the original herd. The two additional herd bulls consist of Eileenmere 1204, son of Eileenmere 1050, the 1950 International Grand Champion, and Prince Eric PM, who was raised on the farm and is the son of Prince Eric of Sunbeam, sire of six international champions.

#### PASTURE DEVELOPMENT

When reclamation work was first begun, it was thought that trees were the only crop which could be grown successfully on the strip-mined land. Thousands of conifers and hardwoods were planted and good results were obtained on survival and rate of growth. However, experimental work in seeding legumes and grasses later proved so successful that since 1943 all the strip-mined area, except a very small percentage, has been rehabilitated for use as pasture land. Three projects have resulted in covering an area of 5,000 acres. Each project is



THROUGH RECLAMATION, P & M has converted 5,000 acres of strip land into rich pasture. Cattle graze in an ideal setting of water, trees and grass.

developed as a farm unit which includes tracts of rehabilitated stripmined land and adjacent unmined flat land where hay and ensilage are grown for winter feeding and supplemental pasture.

The original site for the Angus project was the company's 610-acre Will O'Lakes Farm, 360 acres of which was rehabilitated strip-mined land with well-established pasture of sweet clover and Korean lespedeza. On April 1, 1954, the herd was moved to the company's Chain O'Lakes Farm which provided a larger grazing area and better facilities for handling and showing the cattle. So that proper attention could be given to animals being prepared for shows or sales, the barn previously used for commercial cattle was completely remodeled. This included the installation of box stalls for 25 head of cattle. In keeping with the project, the name was changed to the "P & M Farm."

The Chain O'Lakes Farm was the first grazing project developed by the company (Coal Age, September, 1947) and currently, as the P & M Farm, consists of a total of 1,660 acres made up as follows: 650 acres of rehabilitated strip-mined land with a cover of well-established sweet clover and Korean lespedeza, 250 acres of improved flat-land pasture and 760 acres of crop land. The area is fenced and cross-fenced so that the cattle can be moved from one section to another to prevent overgrazing. Besides the main barn and supplemental buildings, there is a large barn for hay storage and cattle shelter at the end of the strip-land grazing area.

Adjacent to the barn is a 450-ton silo which is filled with ensilage grown on the crop land to help carry the cattle through the winter.

#### ANGUS ALL REGISTERED

Although opinion differs among cattle breeders about the merits of Aberdeen Angus and Hereford cattle, the Angus project was not started to compare the two. Good results have been obtained with both breeds and grades. Much closer attention is given to the Angus cattle but no more than the Herefords would receive if they were all registered animals. On the Hereford projects all the bulls are registered but no attempt is made to produce registered stock. The policy is to use the rehabilitated pasture areas to produce good commercial cattle for the beef market.

Because of the difference in investment, a complete count of the Angus herd is made daily instead of only two or three times a week as is the custom with the Hereford commercial cattle. About 2 wk before calving time, all Angus bred heifers are transferred to a special maternity corral adjacent to the main barn so that they can be given proper care. During the first year the bred heifers were not taken out of the grazing area at calving time. Although the mortality rate was low, there were losses that could have been avoided by timely assistance. Also, the new calves were sometimes difficult to find in the thick clover where they had been hidden. The current procedure of transfer is not only more convenient but has reduced the motality rate.

#### SHOW PARTICIPATION

Cattle from the farm have not participated in many shows. However, they have taken top honors in their class at shows in which entries were made, such as the 1954 Southeast Kansas Aberdeen Angus Association Show and Sale, and the 1953 and 1954 Southwestern Regional Aberdeen Angus Association Show and Sale. As the herd is developed, entries will be made in larger shows and fairs.

Every year since the project was started, the Cherokee County 4-H Club has held a Field Day and Judging School at the farm. Visitors are always welcome and many groups have visited the operations. On May 28, 1955, the Southeast Kansas Aberdeen Angus Association Field Day was held at the P & M Angus Farm. Co-hosts were the Rude Angus Farm, operated by Sen. Leonard Rude, Parsons, Kan., and the C. C. Goodrich Farm, Columbus, Kan. Lunch was prepared by the Cherokee County 4-H Club Council. Dr. Frank Baker, of the Animal Husbandry Dept., Kansas State College, and Jess Cooper, fieldman of the American Aberdeen Angus Breeders' Association, were the principal speakers. The opportunity to cooperate in such events is welcomed by the company, as one purpose of the project is to help build up the quality of the stock in the district by encouraging the breeding of registered cattle.

#### **FUTURE PLANS**

According to future plans, the Angus herd will be developed further to a cow herd of about 150 cows of breeding age. As from the start, all breeding will be done to improve the herd and establish it as top quality. The increase, except the animals maintained to build up the herd, will continue to be sold at consignment sales and eventually at sales on the farm.

The Hereford project will maintain the present policy of using rehabilitated strip-land pasture to produce top-quality commercial cattle. Increases in the herd will be made as mining operations continue and more acreage becomes available for rehabilitation.

Although the Angus project has been operating only 3 yr, the results achieved thus far have been vervencouraging. Experience gained from the project has shown that both registered and commercial cattle can be produced on rehabilitated stripmined land. Through such projects it has also been shown that workedout strip land can become an asset to the economy of the community.

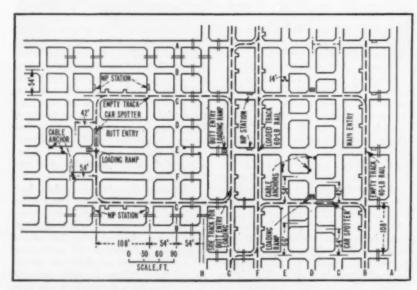


PORTABLE CAR SPOTTERS, in duplicate in two sections, permit "leap-frog" advances of loading point without interrupting triple-shift face operations. Scheduled loading point advances provide better control of haul distance.

Montour No. 4 mine converts butt headings into "long rooms" in . . .

#### Improving Trackless Mining

A CHANGE TO TRACKLESS FACE METHODS and a change from roomand-pillar recovery to a system of driving multiple entries as production openings provide substantial increases in productivity at Montour No. 4 mine, Pittsburgh Coal Co., Div. of Pittsburgh Consolidation Coal Co., Lawrence, Pa. Output from the Pittsburgh seam now averages 3,800 tpd for 295 employees at the mine and 40 at the cleaning plant.



ROOM WORK is eliminated in this Montour No. 4 mining plan in favor of straightaway advance in eight butt headings, then drawing entry pillars.

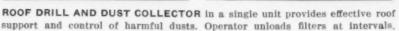
Present emphasis is on the employment of large crews operating reinforced mechanical units to reap the benefits of concentrated operations, including less-complicated haulage, simplified ventilation and more economical power distribution. A normal crew employs 14 men including the section boss and mechanic, and the list of equipment for a unit shows two loading machines, three shuttle cars, two cutting machines, two drills and so on.

The shuttle cars discharge directly into 5-ton mine cars. Unit equipment in two of the re-equipped sections includes a pair of automatic car spotters to permit leap-frog advance or retreat of the loading points without interrupting face operations.

The new look at Montour 4 is the result of a 3-yr development program begun by Pittsburgh Coal management in order to keep the mine in step as a competitive, commercial venture. Large reserves of Pittsburgh-seam coal still are available to facilities at Montour 4, even though the mine has been active for 41 yr. Further gains in over-all efficiency are expected in the near future with the opening of a shorter, faster haulageway from the active sections to the foot of a









DRILLER PREPARES holes in 14-ft face to receive coal-breaking shells.

#### Higher productivity is one of the big benefits resulting from a change to straightaway entry-driving and immediate pillar recovery, using conventional face equipment under bolted roof.

belt slope now being constructed. A near-future relocation of the manportal also will contribute to improved performance.

But the big step forward is the change in face methods, as follows:

is par in mining the Pittsburgh seam.

As shown in the accompanying illustration, the eight entries provide sufficient working places for the large crew and the reinforced unit. The use of twin machines makes it possible to confine particular units to four headings along one side of the panel, thus eliminating the traffic snarls and trailing-cable entanglements that otherwise might result. The equipment operators rotate from one side

#### PRODUCING COAL FROM MULTIPLE ENTRIES

The basic production plan in the newer mining method consists of driving eight 14-ft-wide headings on 54-ft centers to lengths up to 4,000 ft. Entry pillars are removed on retreat. That's it! A panel consists only of this butt entry, which is driven straight to the assigned limit then immediately retreated back to the mains.

Similar panels are working alongside, leaving a 40-ft barrier between an advancing panel and the gob remaining from the previous one. The barrier is extracted as the panel is retreated.

There is no room work, in the accepted sense of the term, although the butt entry may be considered as a set of long rooms. No sacrifice in width has been made, since room work under previous mining systems also was confined to a width of 14 ft, which



PORTABLE MAINTENANCE CENTER is hauled up by shuttle car to keep fast-moving supplies within short distance of face equipment.

to the other, using the twin machines

The extra machines in each section are another result of the concentration coming out of the change in methods. Now there are four units in operation where formerly there were ten. Furthermore, the large crews provide a measure of flexibility in the utilization of manpower, because operators for the extra machines are available when opportunities for making extra falls of coal show up.

The unit machinery includes Joy 14-BU loading machines and 10-SC shuttle cars, Goodman CI-512 cutting machines on T-2 trucks and CP-580 coal drills mounted on Lee-Norse wagons. Airdox is the coal-breaking medium. The cutting machines are equipped with 11-ft bars.

The crew is made up of a loadingmachine operator, two shuttle-car operators, two cutters, a driller, an Airdox operator, a roof-bolter, four utility men, the mechanic and the section boss. The utility men perform such duties as maintaining ventilation, moving up loading-point equipment, making extra cuts of coal when possible, operating the extra machines when necessary and, during retreat operations, acting as timbermen in posting the open-end pillar lifts.

The full seam is mined on the advance, including the drawslate, making a raw product containing about 30% reject. Rate of advance is about 30 ft per day in three operating

shifts.

#### LEAP-FROG LOADING POINTS **ELIMINATE DELAYS**

Each loading point is equipped with a Stamler car-spotter which is operated by the shuttle-car operator to move the mine cars under the elevated boom of his car. As mentioned, two sections are furnished with two of these car spotters to insure minimum delay in advancing the load point as mining progresses. A new loading point is placed in operation after each 216-ft

The track loop for the new loading point is laid without interfering with shuttle-car traffic to the active outby loading point. A plank ramp permits the cars to cross the new track. The spare car spotter then is installed in a breakthrough, thus keeping the unit itself and the work of installing it out of the shuttle-car runways. With this car spotter in place, the locomotive feeds mine cars to the new loading point, and the car spotter at the previous loading point may be loaded onto a mine truck to await installation at the next loading point.

All haulage loops are left in place

because the same loading points will be reoccupied as the section retreats.

Another feature of section layout at Montour 4 are the extra crosscuts close by the loading points, providing greater flexibility in selecting car routes and better control of haulage distances. Normal center distance between crosscuts is 108 ft, leaving 90x 40-ft pillars. However, the row of pillars immediately inby the loading point is opened up through the center, eaving 40x40-ft pillars, as shown in the diagram.

The major benefit derived from this opening shows up during pillardrawing operations. The extra crossway makes it possible for each loading point to handle coal from the inby row of 40x40-ft pillars. In the absence of such an opening, this coal would have to be loaded at the next outby loading point, which is 216 ft

farther away.

#### IMPROVED SERVICES HELP **BOOST PRODUCTION**

The change to driving straightaway entries and the consequent elimination of room work greatly simplifies the work of ventilating the section. The two outside headings are the main section airways, isolated from the other six by stoppings in the crosscuts. Air-locking doors in the track-haulage headings and stoppings in the other headings are designed to permit controlled leakage for ventilating the six inner headings.

Another big advantage in using two rows of stoppings is that the air current must enter and leave the section through the last open crosscut with little chance of interruption.

Roof is bolted in the section by one man operating a Fletcher roof drill which is equipped with an MSA bolt-hole cleaner. The bolt-hole cleaner is

#### In Foremen's Forum . . .

This month you'll find a thought-provoking analysis of our somewhat old-fashioned methods for detecting methane, as an expert sees them. Also, a look ahead at detection methods we might use to keep pace with "automatic" mining, as it now seems to be developing.

The mine of the near-future might feature continuous recorders in the mine, sending reports of gas conditions to control centers on the surface, the author writes. Turn to p 82 of this issue.

a dry dust-collecting unit, furnished as an integral part of the drilling machine by the drill manufacturer. The combined unit has been approved by the Bureau of Mines.

The drill is equipped with Fletcher Hydroslide control, permitting the operator to tram the machine on the centerline of the opening and drill side holes by positioning the drill along the slide bars at the front of the unit. The bolts are installed 3 ft apart across the opening. The rows are 4 ft apart.

Mine officials report that after a short period of promoting initial acceptance of the dust-collecting equipment and training the drill operators in its proper use and maintenance, the units proved to be effective dust collectors. The cuttings are collected at the collar of the hole and drawn by a vacuum pump back through primary and secondary filters mounted at the rear of the machine. The collected dust is unloaded from the filter housings merely by tripping a pair of levers which open the bottoms of the two drums. A shaking lever also is provided to remove the trapped fines from the filtering element. The elements have shown a life of 300 shifts

Suppression of coal-dust hazards is accomplished through the use of sprays on cutting machines and drills and at the loading point. In addition, 91/2 lb of rock dust is distributed for each ton of clean coal mined. The rock dust is spread by the utility men by hand during the working week and by a crew using a Bantam distributor

on weekends.

An improvement in mechanical maintenance on the section has been achieved through the construction of portable maintenance centers which carry a supply of fast moving parts. The maintenance center actually is a skid-mounted steel bin with a flat top providing a bench surface. The unit measures 4x5x12 ft. It is hauled forward in one of the headings by a shuttle car as mining advances. As a result, a supply of spare parts is always available within 100 ft of the

The changes at Montour 4 are part of a continuing modernization program directed by H. C. Rose, president of Pittsburgh Coal Co. J. S. Whittaker, general superintendent, heads up the operations department. Top officials at Montour 4 are S. K. Hissom, superintendent, and Walter Jaap, mine foreman.

The present level of production is a gratifying improvement on the average 2,900 tpd for 400 employees which was the rule 3 yr ago when the new mining system was adopted.

## V & C Coal Corporation found that: "4,000-foot belt reinforced with 'CORDURA' gives trouble-free service in 8-hour-per-day operation"



#### NOW Du Pont SUPER CORDURA makes belts even stronger

The entire production of the V & C Coal Corporation's mine, at Grays Knob, Ky., depends on the performance of the main conveyor belt, shown above, which oper-



VIEW OF LOADING POINT inside mine. The main belt, reinforced with Du Pont"Cordura," is loaded by feeder belts from the different cross entries where the coal is dug. It operates under low-ceiling conditions . . . with considerable dust or dampness.

ates continuously for 8 hours per day. Produced by the Manhattan Rubber Division of Raybestos-Manhattan and sinewed for strength with Du Pont "Cordura" high tenacity rayon, this belt has been steadily extended to reach new working areas . . . now is 4,000 feet between centers. The mine operators report that they have never had any trouble with it . . . though the belt it replaced had broken down at times while operating on 2,800-foot centers.

Now there's a new, stronger reinforcement available for conveyor belting— Du Pont "Super Cordura" high tenacity rayon. "Super Cordura" stretches even less in use and permits belts that are stronger and more flexible. Downtime for take-up and resplicing is reduced to a minimum.

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\*Du Pont's registered trade-mark for its high tenacity rayon yarns.

DU PONT Super Cordura
High Tenacity Rayon



BETTER THINGS FOR BETTER LIVING ... THROUGH CHEMISTRY

# FOREMEN'S FORUM

# Do We Need a Change in Our Methane-Detection Methods?

An expert in the instruments and techniques of gas detection takes a look at the situation in highly-mechanized coal mines. He sees possibilities for improvement and suggests a course of action.

By N. W. HARTZ Instrument Line Manager, Mine Safety Appliances Co. Pittsburgh, Pa.

METHANE DETECTION is a problem as old as the coal mining industry. It is strange then to recognize that it is most generally accomplished on the basis of a development more than 100 yr old.

The flame safety lamp is still the most widely used device for the detection of methane. The Davy lamp originally was designed to provide safe illumination in the gassy coal mines of England. In the interim, more effective lighting means have completely supplanted even the modern versions of the Davy lamp. But the flame safety lamp is still the badge and the tool of the fire boss who tests for methane in most mining operations today. Is it effective? Is it convenient? Is it inexpensive? Is it economical? The answer to all these questions is no.

#### RATING FLAME SAFETY LAMPS

- ●Consider effectiveness. The lowest concentration of methane that can be detected by the flame safety lamp is of the order of 1½ to 2% by volume, in other words from 30 to 40% of the lower explosive limit. This can hardly be said to be effective by modern standards.
- Trained experts are required to read the lamp and other experts maintain it, so it can hardly be considered convenient.
- From the standpoint of expense, it is the least costly of the methane detecting devices insofar as original investment is concerned. However, in studying further the costs of its application, it becomes apparent that it is not the most

economical approach to methane detection.

● The flame safety lamp is valuable only if its reading is interpreted by a qualified expert. This means then that a specialist must carry the lamp to test locations and there observe its performance. Account for that man's time and his pay rate and it is soon apparent that the direct cost of each methane determination is well over a dollar. When the indirect costs of lamp maintenance, overhead and other hidden cost factors are considered this cost per test might well be doubled.

#### OTHER DETECTION METHODS

Over the years a variety of substitutes for the detection and measurement of methane have been tried. These have included a mine-air analyzer and a Haldane-type gas analysis apparatus which utilizes chemical procedures for the analysis of collected bottle samples. The Burrell gas indicator represented an effort to adapt the Haldane test to a more convenient form for usage underground. During the late 1920's, this instrument was looked upon with some favor.

Also in the late 1920's, the Jones gas detector was introduced. Because the latter instrument utilized an ignition coil and spark plug, it had to be operated in a safe atmosphere and bottled samples delivered to it. In the instrument these samples were enriched with increments of propane until an explosive mixture was produced in a test bomb as indicated by a pressure gage. By this means, it was possible to measure the gas concentration to the nearest 25% of the lower explosive limit.

About 1930 the first of the hot-wiretype methane detectors was introduced. These have been gradually improved and simplified over the years and today in the United States are second only to the flame safety lamp in popularity underground.

Such instruments have generally been powered by current from the Edison electric cap lamp. An aspirator bulb is used to draw a sample of air over one of a pair of heated filaments. When methane is present in the sample it is burned upon contact with the hot wire. This results in an increase in temperature of that wire and consequently an increase in its electrical resistance. Because the filament unit is connected as one arm of a balanced electrical circuit, this change in resistance leaves the bridge network un-balanced, and this results in a meter pointer being deflected upscale by an amount proportional to the methane content of the sample. The scale of the meter can be read directly in percentage of methane to an accuracy of the order of 0.05% by volume.

#### **OVERSEAS DEVELOPMENTS**

In Britain, a detector has been developed which is based upon the differential rates of diffusion of gas through a porous membrane. Pressures due to this diffusion are utilized to actuate switches which signal the presence of significant gas concentrations. This system of detection has never gained favor in the United States.

In addition, the principle of interferometry has been adapted to methane detection. Instruments of the latter type have been used most widely in Germany and Lappan

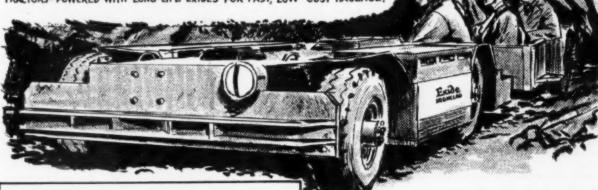
While the latter instruments have the advantage of extreme simplicity of operation, there is the possibility of confusion in the interpretation of results because a multiplicity of interference lines are produced. The observer must consistently observe the same line or he obtains erroneous readings. In addition, the in-

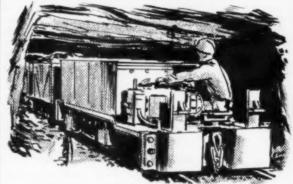


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Exide INDUSTRIAL DIVISION, The Electric Storage Battery Company, Philadelphia 2, Pa.

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struments are not specific and as a consequence will respond to any gaseous contaminant that is present in the air sample. For this reason, such instruments used in mining service are generally equipped with chemical scrubbers for removing water and carbon dioxide from the sample air. These must be carefully maintained.

The hot-wire-type of detector, which of all the other methods has proved to be most popular and the most precise form of portable methane detection, has been similarly adapted by industries outside of coal mining. As an example, it is not unusual for public-utility companies distributing natural gas, which is substantially all methane, to use hundreds of these devices for detecting and locating leaks in their distribution systems. This style of instrument has been adapted by competitors to the mining industry and has contributed tremendously to reduction in product loss, reduction in hazard to life and property, and improvement of the safety record of user organizations.

Manufacturers engaged in the development of such instruments may have been remiss. Perhaps they have not been forceful in calling to the attention of the mining industry the benefits to be gained by using a more modern, more sensitive, more accurate method of gas detection than the widely used flame safety lamp.

#### NEEDS IN MODERN MINING

This situation is apparently accentuated in today's rapid application of automatic mining principles. Ventilating air costs money. It is important that available air be utilized to the best possible advantage to maintain a safe atmosphere within the mine. By reading more accurately the combustible content of the air, ventilation patterns can be established that will provide for most efficient use of that air. As automatic mining machines expose new faces much more rapidly than when worked with hand tools, the dangers of methane accumulation are greatly increased. It would therefore appear wise to have crews alerted to the first significant show of gas from such operations.

In discussing automation in the mining industry, this logical question must be asked: Why not consider automatic gas detection along with automatic cutting, loading and hauling. Some feeble steps have been made in this direction.

As early as 1930, automatic continuous methane recorders were produced in the United States. Since then, a variety of instruments of the same general nature have been developed. For some reason they have not been adopted. There is a need for such instruments in the coal mining industry. If they are properly applied, ventilation costs can be reduced, and safety to life and property can be materially improved.

There are several shapes that such equipment might take. The classic one, for which the previously mentioned continuous recorders were developed, is the monitoring for methane of return air. Such instruments have been developed to analyze continuously the return air for methane and to actuate a recorder to

produce a continuous record of the methane content of the air exhausted from a mine. Or the analyzers could be located underground and there continuously analyze the methane from each air split and, by a single electrical hookup, convey the intelligence for a continuous record or for an alarm signal to surface sites. These would indicate when corrective action was necessary.

A group of individual analyzers could be used to provide signals for a multipoint recorder to produce separate records for each air split, or, in a less elaborate setup, the instruments could be made to actuate a signal system to show which air split was carrying an abnormally high methane concentration.

high methane concentration.

Such instruments could likewise be made to follow the progress of coal cutting machines and to provide their signals either to the machine operator, other adjacent personnel underground, or, if desired, to a surface station.

...The British and the Germans have recognized the needs for continuous methane analyzers underground, and they have made some efforts to adapt the type of instruments with which they are most familiar. The British use of continuous instruments have been based on their diffusion type instruments. The Germans have used a positive filter type infra-red analyzer. These efforts originated more than 15 yr ago and they indicate more concern with the problem in those countries than has been manifest here, where the problem has been accentuated by the more widespread use of mechanical mining equipment.

With the introduction of continuous mining machinery, the working face is today being advanced at a rate about thirty times that which was normal only a few years ago. Methane liberation is proportional to this rate of advance. In practically all instances, the machine operator has available for observation a flame safety lamp, the same detector that was used a hundred years ago.

#### INSTRUMENT DESIGNS

The instruments proposed for continuous methane detection operate upon the same basic principle as the hot-wire methane detectors in general usage in the mining industry today. To withstand continuous operation, the filaments are of somewhat heavier construction. Instead of using power from a cap lamp battery, the bridge circuit is operated from the available AC or DC power service at the installation site. In view of the use of this higher voltage, the instrument and its accessories are contained in explosion-proof housings. Substantial dust filters are provided for each sample inlet tube. If desired, one analyzer might by means

#### In a nutshell . . .

If you have plans for tomorrow, be eareful today.

Throw discretion to the winds and it's whipped back in your face. The impossible is what nobody can

do until somebody does it.

—Bell & Zoller Safetygram.

of a motor-operated multi-way sampling valve be used to test from four, six, or eight locations. An explosion-proof, motordriven pump is provided for drawing air samples.

While the concept of using such instruments in this fashion may be new, the equipment that would be used for this service is not new. Such instruments have been widely used in other industrial activities to safeguard life and property. The natural gas industry used them to detect leaks in compressor stations, in automatic regulating stations, in waterless gas holders and in consumer plants.

The petroleum industry makes similar use of these devices in the transportation, distribution, and storage of their product as well as for the protection of some of their refining operations. Closely akin to mining problems, such devices also are used in connection with the drilling of oil and gas wells to detect the first gas or vapor entrained in the drilling mud. This shows when the drill is approaching a gas or oil bearing sand.

Solvent extraction plants, paper and fabric coaters, paint and varnish manufacturers, chemical and pharmaceutical plants laboratories and many other operations are regularly protected by such instruments.

Some of these facilities represent a capital investment of perhaps \$50,000 and employ only a few men, yet they find the installation of continuous monitors for combustible gases a good investment. People who operate such plants realize the necessity of good maintenance and practice it. In spite of their precautions, there are numerous instances where instruments have signaled the presence of unsuspected concentrations of combustibles, perhaps preventing a serious accident. In view of these records in other industries, similar results in coal-mine operations can be anticipated. If it is considered prudent to protect a small industrial activity above ground against the hazard of gas explosion, it is many times more important to provide continuous detection means underground where many lives and properties valued at millions of dollars may be involved.

#### NOW, PORTABLE ALARMS

Within the recent past, a portable methane alarm, a compromise between the portable detectors used for "spot checking" methane concentrations and permanently installed instruments, has been introduced. These use the heavy duty filament of the permanently installed instruments but are powered by a separate cap lamp battery which provides sufficient power for continuous operation throughout one shift. Such instruments are rugged enough to be mounted on a continuous mining machine. Whenever the atmosphere in which the instrument is operated contains more than one per cent methane, a flashing red signal light is actuated.

Perhaps through the use of these less elaborate alarm instruments the desirability of permanently located instruments will be shown, and the art of gas detection underground will be modernized in keeping with progress in the other facets of the mining industry.

## Wenco answers your coal cleaning problems

# WEMCO SAGRAGIA PLOTATION MACHINES WEMCO SAGRAGIA PLOTATION MACHINES WEMCO EQUIPMENT Comming Antiback Contents

#### WEMCO HMS MOBIL-MILLS

World's most widely used heavy media separation plants; available with a choice of separatory vessels; capacities 25 to 500 TPH; will handle feed range from 8" to 3/32".



#### TWO-COMPARTMENT DRUM SEPARATORS

Two-gravity, three-product heavy media separation in one vessel. Less than 1% misplaced material on a feed of 114 TPH of  $2\frac{1}{2}$ " x  $\frac{1}{4}$ " coal indicated in typical operating report.



#### WEMCO HMS EQUIPMENT FOR CUSTOM PLANTS

Separatory drums and cones, densifiers, medium pumps and media reclamation circuits of the superior designs so thoroughly proven in the Wemco Mobil-Mills.



#### WEMCO TORQUE-FLOW SOLIDS PUM?

A remarkable new pump that can handle chunks up to several inches in diameter; available in capacities 100 to 3,000 GPM; handles heads up to 120 feet.



#### **FAGERGREN FLOTATION MACHINES**

Most efficient per cubic foot of all modern flotation machines. Extract saleable coal in the range from 14 to 325 mesh plus solving disposal problem.



#### WEMCO COAL SPIRALS

Efficient, low cost dewatering and/or sizing device that achieves more complete moisture removal than the drag tank; also fewer working parts and no stalling problems.



#### WEMCO HYDROSEPARATORS

High capacity means for making an efficient separation in the 200 mesh range; used to deslime coal ahead of tabling or flotation; diameters to 150 feet.

#### **WEMCO LABORATORY SERVICES**

All necessary tests are available to determine practicability of various coal cleaning methods for treating your run-of-mine coal.

#### **WEMCO THICKENERS**

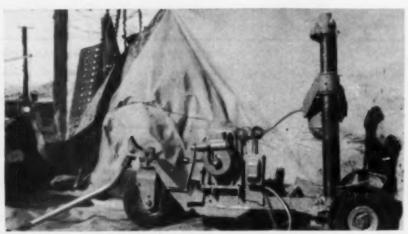
The perfect compromise between acreage and horsepower in clarifying water for closed circuits, or for pollution-free stream disposal; diameters to 400 feet.

The full available information on any of the above equipment items will gladly be mailed in answer to your inquiry. More detailed recommendations for your specific coal cleaning problem will also be furnished, if desired. Write Dept. G-2212.



Representatives in principal cities of the United States and Canada and in major countries throughout the world.

# OPERATING IDEAS





MINE-BUILT ROOF-DRILL made from scrap equipment utilizes a war-surplus bomb carrier, a coal drill, part of an old washing machine and other odds and ends. Drill is raised and powered by hand windlass.

#### Have You a Roof Drill in Your Scrap?

By L. A. ENGSTROM, Engineer The Kemmerer Coal Co. Frontier, Wyo.

KEEPING ROOF-BOLTING IN STEP with the cycle has been solved at the Gunn-Quealy Coal Co., Quealy, Wyo., a subsidiary of The Kemmerer Coal Co., through construction by the shop crew of an extra bolting machine, using scrap materials available at the mine.

Mining operations at Gunn-Quealy recently were changed from strip mining to an underground operation. Underground mining was started by opening several portals in the highwall left by stripping. Of course, the start of the underground development had to wait until stripping of overburden and coal removal were nearly completed, and as a result, several "bugs" were encountered in the switch.

To mine the 55-in No. 7 coal seam, the underground operation was planned as a twin unit—each unit to consist of a Joy loader, two shuttle cars, drilling and shooting crew, a cutting machine crew and a roof-bolting machine. As this type of operation was new to the company, some production problems were encountered. One of the first "bugs" was the inability of the roof-bolting crews to keep step in the cycle.

Mike Zakotnik and William T. Steinhour, company officials in charge of operations, decided that an extra homemade roof-bolter would help keep the cycle in step and be on hand to pinchhit when a bolting machine was down for repair. They kicked their ideas around with "Corky" Middleton, master mechanic, and soon they were poking into the scrap pile on the mine's "Tobacco Road," looking for material.

A war-surplus bomb carrier, a 572 coal drill, worm gears and parts of an old clothes washing machine, 20 ft of 1/4-in wire rope, magnetic switch, brass bushing and odd pieces of iron and pipe were collected. The bomb carrier was stripped of its bomb-lifting devices and the frame was cut, inverted and welded, to provide the clearance necessary in the mine. As shown in the photographs, two standards were mounted on a rocker arrangement to permit low roof clearance. The 350-rpm 572 coal drill, using 250 v DC, was mounted between the standards. The drill is raised and lowered manually with a windlass from a worm gear of the old washing machine. The original light bearing in the 572 drill was too weak for the thrust developed and had to be replaced with a heavy-duty bearing. No down time has been experienced with the unit.

With a two-speed handle on the worm gear and the motor mounted with a grease fitting on the brass bushings, very little effort is needed for the raising and lowering operation. The bolter is raised off the ground by the two hand jacks which relieve the tires of the drilling pressure and provide a steady footing.

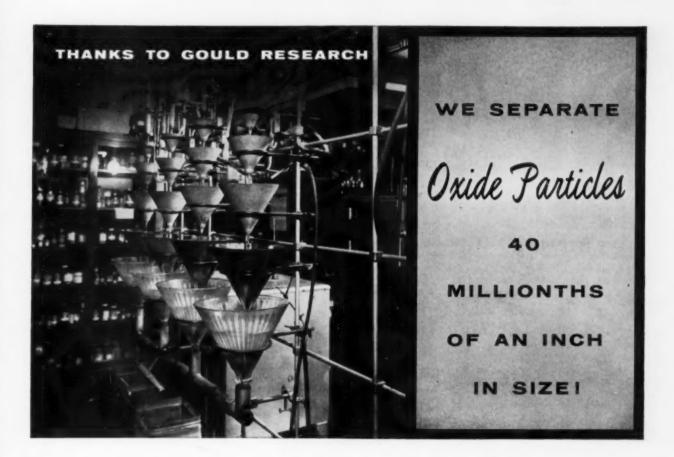
To start a hole in the dense, finegrained shale roof, a 1%-in tungsten-carbide roof-bolting bit is used. Holes are completed with a 1½-in bit and ¾-in



HAND JACKS raise bolter off ground, relieving tires and providing a steady footing.

bolts up to 5 ft long are installed. The roof bolts with expansion shells are tightened with a DC impact wrench. The home-made bolter is capable of installing as many bolts per shift as the manufactured machines. While the bolter is being moved to the next hole, the helper can secure the bolt with the wrench, so that there is very little waiting time for either man.

The shop crew, Frankie, Johnnie, Pete and "Corky" would each work over some used or scrap item during dull moments, so that the name "Tobacco Road" seems fitting. At a cost of less than \$800, roof looling is no longer a bottleneck and, as might have been expected, the "extra" bolter has very little idle time.



#### TO GIVE YOU GREATER BATTERY CAPACITY!

Illustrated above is a Thompson Classifier in the Gould Battery Research Laboratory at Depew, N. Y. It is used to separate, by flotation, particles of lead oxide so small that they'll pass through the finest sieve made.

Particle separation is important in achieving uniformity of oxide . . . and battery capacity and life are helped by having each type of oxide fall within a specific particle size range.

This method of particle separation quickly determines which oxides are best for various types of Gould Batteries. Another reason why you get better batteries from Gould through research.



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GOULD
Shuttle Car and
Locomotive Batteries

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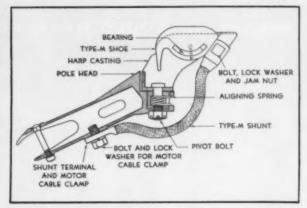
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GOULD-NATIONAL BATTERIES, INC. TRENTON 7, N. J.

"BETTER BATTERIES THROUGH RESEARCH"

Always Use Gould-National Automobile and Truck Batteries





INCLUDE BOTH ENDS of your trolley poles in regular maintenance if you want maximum efficiency and service life from collector shoes. Simple test (below) indicates condition of often-neglected trolley bases. Periodic checks of complete collector assembly (right) also assure economical operation. Harp and pole casting bearing surfaces require occasional oiling; curved bearing may be lubricated with graphite; shunt should be in good condition, with insulation intact; and shunt terminals should make tight connections at both ends.

#### Don't Let Your Trolley-Pole Bases "Pass the Buck"

PROPER MAINTENANCE of trolley bases on mine locomotives can mean a big difference in the service life of collector shoes. Yet experience seems to indicate that trolley bases are often neglected in most locomotive maintenance programs.

These suggestions for more effective trolley-pole operation, together with this simple experiment that may show you how to get more miles from every collector shoe you use, appeared in a recent issue of the O-B Haulage Ways, published by the Ohio Brass Co.

The only equipment needed is a simple spring scale. With the shoe off the wire but at wire level, hook one end of the spring scale over the collector shunt and pull the pole down. Note how many pounds of pull is required to do this.

Now slowly ease off until the pole begins to rise. Once again, note how many pounds of pull register on the scale as the pole is allowed to move slowly back up toward the wire.

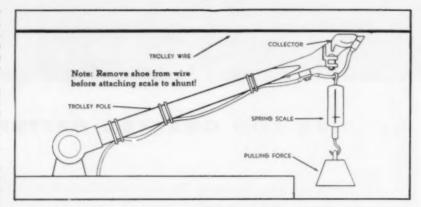
What does this prove? Well, just as an example, assume that it required a 30-lb puil to draw the pole down from the wire and that the pole moves back up again when you ease off to a 16-lb pull on the scale. This difference of 14 lb is used in overcoming friction in the pole base.

Under ideal conditions, the two figures should be pretty close together. If a 20-lb pull is required to lower the pole, it should return to the wire when the pulling force is decreased to 17 or 18 lb. Only 2- or 3-lb pressure should be required to overcome friction in a well-lubricated and well-maintained pole base

When it requires 14 lb to overcome this friction (as in the example above) something is wrong.

Usually the cause of the trouble is failure to lubricate the pole pivot pin and accessory parts of the pole base.

At most mines, every locomotive is



FOR SIMPLE TEST of trolley base operation, attach spring scale to collector shunt and determine pulling force needed to bring the pole down from wire height and the pull at which pole returns to wire. The figures should differ by only 2 or 3 lb with a well-lubricated and maintained pole base.

thoroughly serviced and inspected at Maintenance men regular intervals. know that a common sense program like this pays off in better operation, fewer breakdowns and lost time, and greater safety. Yet the same maintenance program is rarely extended to include the trolley-pole base on the locomotive.

The result is often a base that's stiff and dry, packed with dust and grit around pivot pin and other moving parts. A base like that cuts shoe life ' because it "passes the buck" to the shoe at every bump and rough spot.

Instead of maintaining an even pressure on the wire, moving easily up and down at rough spots or changes in wire height, the pole is stiff and inflexible. When the pole should dip suddenly, it lags behind and momentarily lets the shoe take greatly increased pressure against the wire. And when the pole should bob up quickly, it lags again, and

lets the shoe spark and clatter over a length of wire it hardly touches. Too much pressure here, not enough therethat's the way it goes all along the

Actually, there's no reason why your trolley shoes should have to take the beating they get from poorly maintained bases. And they wouldn't if trolley base lubrication were tied into regular locomotive maintenance programs.

Make the simple spring scale test ourself at the first opportunity, and see if sluggish bases are robbing you, too, of valuable shoe mileage.

Then, when the locomotive is side-tracked for maintenance, be sure the trolley base comes in for a little attention too. It takes only a few minutes and a few cents worth of oil and grease to keep bases in good condition. And by spending pennies to lubricate bases, you can save dollars on longer wearing shoes.

# the modern lighting SYSTEM

...better serving miner and operator alike

# WHEAT

Modern Lamps



National Mine Service Company

Modern Charging



Effective, dependable WHEAT light for the miner is the product of a complete system, meeting the needs of today's mining management for maximum efficiency and economy in operation. This system is more than a fine cap lamp—more than a modern battery—more than genuine automatic charging. It is the sum of these plus National Mine Service in every coal mining area, service that is elbow-close to every Wheat equipment owner. Let us itemize the advantages to you, without obligation—now!

Modern Service



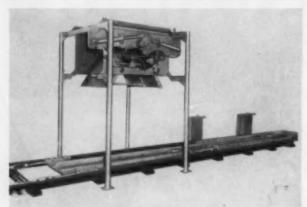
National Mine Service Company has the facilities
-delivers the goods

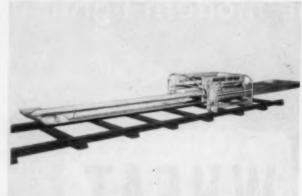
564 ALCOA BUILDING, PITTSBURGH 19, PA.

The trend is to WHEAT

7 PLANTS TO SERVE YOU ALL-STATE DIVISION, Logan, W. Va.; ANTHRACITE DIVISION, Forty Fort, Pa. ASHLAND DIVISION, Ashland, Kentucky; BEMECO DIVISION, Beckley, W. Va.; KY.-VA. DIVISION, Jenkins, Ky.; WESTERN KY. DIVISION, Madisonville, Ky.; WHITEMAN DIVISION, Indiana, Pa.

# EQUIPMENT NEWS





#### **New Units Improve Mine-Car Loading Efficiency**

Two new equipment units designed for more efficient loading of mine cars underground have been announced by the Nolan Co.—the Nolan automatic loading station (left) and the new hydraulic lift dolly (right) for speedy moving of Nolan Porta-Feeders and other car spotters.

The automatic loading station features a hydraulically operated flygate and hopper, with either a hydraulically actuated yoyo clutch or electrical interlocks provided for use when chain-and-flight conveyors are being reversed. Fully automatic hydraulic control is interlocked with a Nolan NCN hydraulic Porta-

Feeder in the unit, the company reports.

Controlled loading of cars is accomplished with a Nolan loading bar. This protects against over-filling either the unit being loaded or the oncoming empty, which receives the coal at the time of car change. Included in the Nolan automatic loading station are car-body-operated valves to secure continuous forward motion at the time of change and also to insure stoppage of all equipment when the final unit has been loaded.

Developed to save considerable time during loading-point changes, the new Nolan lift dolly has four ¾-in roller chains equipped with hooks that attach to loops on the bed plate of the car spotter, which is raised in approximately 50 sec by means of a hand hydraulic pump and lowered through use of a release valve. The dolly, with the Porta-Feeder bed plate, may be moved by hand or locomotive. Mounted on 10-in cast-steel ball-bearing-equipped wheels, the Nolan hydraulic lift dolly weighs slightly over 300 lb, its light weight resulting from the tubular high-carbon steel used in its construction.

Catalog with details of these and other Nolan equipment for coal mining is available from the Nolan Co., Bowerston, Ohio.



#### **Dozer Speeds Up to 27 MPH**

The Michigan Model 180 Turbo-Dozer, reportedly the first rubber-tired dozer powered by a turbocharged diesel engine, has been introduced by the Construction Machinery Div., Clark Equipment Co., Benton Harbor, Mich. The unit has a 165-hp rating and a capacity of 2% yd. It has a road speed of 27 mph, said by the maker to be the fastest in its field, and has 4-wheel drive and rear-wheel steering which permits full power on wheels even while turning. Among operational advantages cited

by the company are hydraulic controls which facilitate easier maintenance, a bowl which can be tilted by the operator while the machine is in motion and the ability to move under its own power over the highways. Like the Michigan tractorshovel line built by Clark, the Turbo-Dozer features a power-shift transmission, a heavy-duty torque converter which automatically provides up to 3:1 torque multiplication and planetary wheel drive axles. Full data from the company.



**Light Truck for Off Highway Service** 

A new four-wheel drive, light-duty International truck specially designed with power and traction to travel cross-country Where hole depth is less than 36", Chicago Pneumatic's RBD-30 Permissible Roof Bolting Unit can complete an entire roof-bolting cycle in 1½ minutes flat! In areas where deeper holes are required, CP completes the job in less than 3 minutes time.

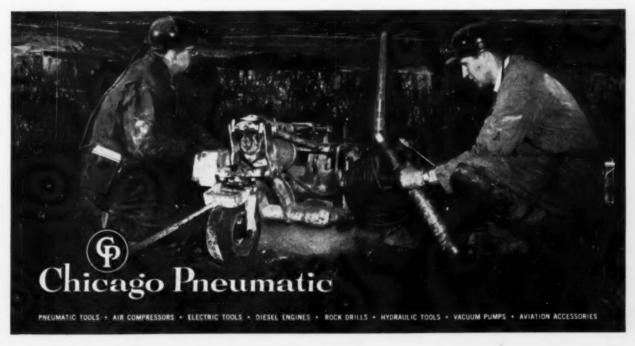
The mobile RBD-30's low height gets it into low ceiling areas usually inaccessible to other machines. And the chuck is telescopic . . . can be adjusted 6" to meet roof

irregularities. Built-in slip clutches prevent stalling... protect the drill and bolt setting motor. The Chicago Pneumatic RBD-30 is available with these extras: (1) water swivel attachment for wet drilling, (2) special low speed spindle attachment for slow speed drilling, (3) low seam drilling attachment for extremely low coal areas. Write for details. Chicago Pneumatic Tool Company, 8 East 44th Street, New York 17, New York.

#### CP drills hole and sets bolt



in Seconds!



fully loaded in mud, sand or snow has been introduced by the motor truck division of International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill. The R-120 (4x4), has a gross vehicle weight rating of 7,000 lb, and is offered in four wheetbases between 115 and 134 in with pickup, stake or flatbed body, or as chassis and cab for a special body. The truck is expected to be particularly effective in exploration, stripping and maintenance work where the greater traction and flotation

provided by four-wheel drive is a distinct asset, the company points out. Powered by the 108-hp International Silver Diamond 220 engine, the new International can be operated on hard-surface roads as a conventional rear-wheel drive truck, while the front axle drive can be engaged quickly and easily by a shift lever. It is available with power take-off, front winch and various optional equipment. Full details available from International Harvester.

drive consisting of torque converters and semiautomatic transmission. Completely eliminating clutching and permitting change



#### Two 18-Yd Scrapers for Fast Loading

Euclid Div., General Motors Corp., Cleveland 17, Ohio, has announced two new overhung-engine-type scrapers, each with a struck capacity of 18 cu yd and utilizing Allison "Torqmatic"

from one speed range to another under full power, Torqmatic drive provides a constant, smooth flow of power to the drive wheels and automatically provides the power needed for varying conditions of loading, hauling and dumping, the company says. Both scrapers are equipped with "No-Spin" differentials to provide maximum traction by directing full torque to the drive wheel with the best footing. The Model S-18 is powered by 300-hp engine and has 27.00x33 tires. The Twin-Power Model TS-18 scraper (illustrated) has two 194-hp engines, one driving the tractor wheels and the other the rear wheels. Full 90-deg steer permits both models to make 180-deg turns in 35 ft or less. With 4-wheel drive and a total of 388 hp, the TS-18 is said to offer the power and traction required for self-loading in practically any material and for fast travel speeds on steep grades and difficult hauls. Since it does not require a pusher, this scraper has extremey good versatility and on many jobs is actually a one-man earthmoving crew, the company points out. Full data from Euclid.

#### RUBBER CHUTE LINING BONDED TO METAL PLATE

A metal-backed rubber chute lining that can be used as a basic construction material and can be installed in existing or new structures has been placed on the market by Goodyear Tire & Rubber Co's Industrial Products Div., Akron, Ohio. Called "Armaplate," the new product consists of abrasive-resistant rubber bonded to hot-rolled steel. It can be formed, sawed, sheared, rolled, bent and punched like sheet steel and can be bolted or tack-welded. The steel-bondedto-rubber technique prevents foreign matter becoming lodged between the metal and rubber bond. Another advantage is that an operator can use the product as received, instead of applying rubber lining to a metal chute, hopper or bin, the company points out. Armaplate is being sold in four sheet sizes, in four over-all gages. More details from Goodyear.

#### NEW-TYPE AC MOTOR OFFERS VARIABLE SPEEDS AND RANGES

A new type of variable-speed AC motor is being manufactured and made available for the first time in the United States by Bogue Electric Mfg. Co., 52 Iowa Ave., Paterson, N. J. Developed abroad, the Bogue N-S variable-speed AC motor is said to completely eliminate all gears and mechanical means of power transmission. It can be equipped with controls ranging from completely automatic through semiautomatic to manual and has a high efficiency that is maintained under conditions ranging from sudden stops to reversing or inching, it is reported. The motor can provide from 0.5 to 1,000 hp with a speed ranging from 30:1 to 1.5:1, and is designed to operate on three-phase AC power of 50,

60 or 400 cycles. These advantages, plus the fact that the motor is adapted to high starting torque loads, make the unit ideally suited for a wide range of applications, the maker says. Full details from Bogue Electric.



#### NEW-TYPE DENSITY SCALES GIVES DIRECT READINGS

A new-type pulp-density scales announced by the Mine & Smelter Supply Co., 1439 17th St., Denver, Colo., is applicable over any range of solids, light or heavy density. The outstanding feature of the new Marcy scales cited by the maker is that it permits direct reading of: weight of sample in grams or kilograms; specific gravity of liquid; specific gravity of pulp; percent solids contained in a pulp of any specific gravity; specific gravity of dry solids. The filled container is simply hung on the scale hook and information is read directly from dial without reference to separate

charts or tables, thus saving time and eliminating errors in calculations. Although only 10-in in diameter the scale is said to be equivalent to a 47-in beam balance in accuracy. Bulletin from company.



#### 16-LB ELECTRIC CABLE VULCANIZER

A new electrically operated cable vulcanizer, reported to weigh only 16 lb, less molds, yet capable of making repairs on cable up through 2 in in diameter, has been developed by the Joy Mfg. Co. Available for use on standard AC and DC voltages, with a wattage rating of 1,000, the new units are designed to make quick on-the-job jacket repairs or to completely replace insulation and jacketing when splices are required. Aluminum molds for use with the vulcanizers have been developed to cover most standard and many special types of cord and cable. Full details from Dept. C-9, Joy Mfg. Co., Oliver Bldg., Pittsburgh 22, Pa.

#### FLOCCULATING AGENT

Development of a new synthetic resin flocculating agent for use in disposal or recovery operations involving clarification, sedimentation or filtration has been announced by the B. F. Goodrich Chemi
(Continued on p 93)

Announcing.....

A new concept in mine safety engineering!

# о-в <mark>Magna-Irip</mark>。

- **NOW**—A Circuit Interrupter that "knows the difference" between an overload and a short circuit!
- **NOW** A new way to deliver continuous power *and* continuous protection to face machinery with complete freedom from false tripping on overloads!
- **now**—All the short-circuit protection your cable can use—at a rockbottom price!
- **NOW**—A portable, light-weight, dust-tight unit you can plug into anywhere!



IN CANADA: CANADIAN OHIO BRASS CO., LTD., NIAGARA FALLS, ONT.

Feeder and Tralley Materials . Control Materials . Tralley Shoes . Roof Balt Shells and Plugs . Bail Bands . Automatic Couplers



#### a new kind of protection for trailing cables!

Suppose you took this new Magna-Trip Circuit Interrupter underground in your mine, hooked it up to a power source near a room neck, and plugged in a trailing cable—your cutting machine cable, for example,

Would the cutter cut faster? Would it make more cuts per shift? Would it run more smoothly—make any significant contribution to increased production? What would happen on normal overloads? . . . on dangerously high overloads? . . . on short-circuits?

We got the answers to these questions the same way you would—by testing Magna-Trip for several years in regular underground production cycles under all kinds of operating conditions.

Here's what we found out-here's what's in store for you.

#### Magna-Trip Eliminates False Tripping on Heavy Workloads!

Cutting machines protected by Magna-Trip rip through the face day after day without stoppages and without incident. Starting currents and temporary overloads can rise as high as 400 or 500 per cent of normal load, yet Magna-Trip won't stop production. Brief overloads in this range are "workloads"—"payloads"—and Magna-Trip allows you to take advantage of them without the nuisance of unnecessary tripping.

#### Magna-Trip Protects Against Dangerously High Currents

With Magna-Trip on the line, you won't have to worry about running into trouble when a temporary current climbs too high for safety. When the cutter bites off more than it can chew, Magna-Trip opens the circuit to prevent short circuits and injury to cables.

In other words, your cutter gets full and uninterrupted power on the legitimate workload, but it's never allowed to carry a load that exceeds the machine's capacity.

#### Magna-Trip Prevents Damage From Short Circuits

The first time Magna-Trip broke a short circuit during its two-year test period, the operators couldn't understand why their machine stopped. They heard no noise, saw no smoke or flame, noticed nothing wrong with their cable. The machine simply stopped.

It wasn't until later that they saw the break in the cable that allowed a power conductor to ground on the machine frame as the cable wound onto the reel.

In one split-second operation, Magna-Trip had saved enough cable to pay for itself completely!

You'll be just as surprised the first time Magna-Trip interrupts a short for you, because Magna-Trip doesn't wait until the short circuit current gets high enough to cause serious damage. In fact, Magna-Trip starts to trip before the short circuit current exceeds the current of a normal overload!

That, briefly, is what it's like to have Magna-Trip at the end of your trailing cable. If you use trailing cables anywhere, you'll be interested in the information on the next page.



Okio Brass.

CHELD BOHIO, U. S. A. MANSFIELD IN CANADA: CANADIAN OHIO BRASS CO., LYD., NIAGARA FALLS, ONT.

Feeder and Tralley Materials . Control Materials . Tralley Shoes Roof Bolt Shells and Plugs . Roll Bonds . Automotic Couplers



# 100 and 300 ampere models for grounded or ungrounded systems

#### Type A Magna-Trip

Available in 100 and 300 ampere models. Operates with or without safety ground wire. Type A features 1) fault current or "rate of rise" tripping on short circuits and, 2) instantaneous overload tripping on extremely high motor overloads.

#### Type B Magna-Trip

Available in 100 and 300 ampere models. Type B requires a safety ground. Type B features 1) safety ground tripping on short circuits and, 2) instantaneous overload tripping on extremely high overloads.

Write today to the Ohio Brass Company, Mansfield, Ohio, for complete information about Type A and Type B Magna-Trip Circuit Interrupters.



A R. H. Marrielle & Cornell Manufall & Partler Street & Badd State and Phone & Ball Book & Automotic Country

cal Co., 324 Rose Bldg., Cleveland 15, Ohio. Called "Good-rite K-720," the material serves to collect small solid particles into larger clusters, facilitating separation of the dispersed solids. The agent improves the degree and rate of sedimentation and at the same time improves the filtration rate characteristics of dispersed solids, it is said. In filtration, flocculation with K-720 reportedly forms a more porous filter cake with resultant reduced pressure drop and increased throughput. Efficient washing of the filter cake is more easily accomplished. The excellent qualities gained from K-720 may be achieved at very low cost since treatment as low as 0.01 lb of K-720 per ton of dispersed solids normally is sufficient. It is also available as a 20% water solution identified as Good-rite K-720S. It is said by the maker to be effective in solving pollution and recovery problems. Technical data from the company.



#### NEW ENGINE PROVIDES DIESEL ECONOMY FOR SMALLER TRUCKS

A new lightweight, 175-hp "Turbo-diesel" has been announced by Cummins Engine Co., Inc., Columbus, Ind. The new JT-6 Turbodiesel is a six-cylinder unit which, installed in a truck, weighs only 1,615 lb, or 9.2 lb per horsepower. The JT-6 Turbodiesel weighs 800 lb less than other Cummins diesels of equivalent horsepower, and is comparable in weight to gasoline engines of similar power. Development of the unit represents one of the most important milestones in diesel history, Cummins Engine reports. While over 50% of the trucks of over 26,000-lb GVW are now diesel powered, only about 10% of those in the 19,500- to 26,000-lb GVW class use diesels. The high horsepower, light weight and diesel economy advantages are expected to appeal especially to operators using trucks of the latter classification. The reduction in hourly operating costs possible with the JT-6, as compared with gasoline engines, will also appeal to operators of mediumheavy-duty dump trucks, ready-mix trucks and other operations, the company says. Leading truck manufacturers have incorporated the JT-6 as standard diesel power for their light-weight, space-saver designs, it is said. Full details from Cummins Engine, Inc.



#### **Attractive Coal Souvenirs Offered**

A German manufacturing concern and one of the Ruhr district collieries are collaborating in the production of carbon-ceramic souvenirs made of coal. Typical articles shown are a desk clock (left) with carbon-ceramic dial, 8-day works and hand-milled Zodiac ring, bottle stopper made of carbon-ceramics and silver-plated brass, carbon-ceramic paper weight, and say tray with lighter (right)

weight, and ash tray with lighter (right).
In processing the "new kind of material," coal is pressed and ceramically

hardened to give an appealing surface. The material is then moulded by special manufacturing methods into any specified pattern. Flat articles can be made with embossed parts as high as ¾ in. A variety of effects also can be achieved by coating the coal with ducat gold. This enables such reproductions as medieval miners' fashions.

Catalogs and further information can be obtained by writing to G. Balke, Triplex, Erpel Am Rhein, Germany.

Wis., is currently available in sizes ½6x% to ½x% in, inclusive, in transparent green or opaque white, with strengths from 480 to 7,000 lb. The new cable is either a preformed galvanized steel or stainless steel wire rope coated with strong, tough, flexible plastic, which does not affect flexibility of the rope. It resists sunlight and oxidation, and provides excellent color stability. It is resistant to most acids, bases, salts, oils and greases, except hydrofluoric acid and methyl ethyl ketone, the company says. Bulletin 5540 with full details from Macwhyte.

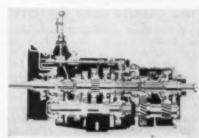


#### **NEW RAIL-CAR MOVER**

HemcO Mfg., Inc., Argonia, Kan., has announced several changes in its new model "HemcO-Motive," a roadable-type rail-car switcher that utilizes the car's weight, through weight transfer, to obtain traction. The HemcO Motive is now equipped with a coupler that gives positive connection with the rail car and permits coupling with ease to either side. Another improvement is a fluid drive, which facilitates handling of heavy loads and also saves the power train from sudden shock load, meaning lower maintenance. Equipped with rubber tires for ground operation, the HemcO-Motive develops a drawbar pull of 7,400 lb, which under average conditions, is sufficient to propel three fully loaded cars. Bulletin from company.

#### PLASTIC-COATED WIRE ROPE

All-new plastic-coated steel-wire cable announced by Macwhyte Co., Kenosha,



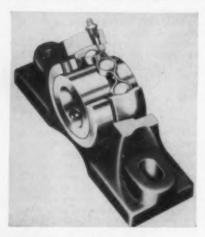
#### NEW TRUCK TRANSMISSIONS ELIMINATE GEAR SPLITTING

Two new semiautomatic "Roadranger" transmissions have been announced by the Transmission Div., Fuller Mfg. Co., Kalamazoo, Mich. The new 8-speed R-46 is designed for on-and off-highway trucks in the 150- to 200-hp class. The new Model R-1150 9-speed heavy-duty transmission is designed for trucks up to 300 hp, developing up to 800-ft-lb of torque. Both units provide shifting with a single

lever that is smooth, fast and easy through the new Fuller "All-Air Range Shift Control," which offers the same pre-selective features as the original Fuller air-electric system. By eliminating gear-splitting, the new transmissions are said to reduce RPM loss between shifts and minimize engine lugging—resulting in higher average road speeds with greater fuel economy and improved control in traffic and on grades. The R-46 requires less installation space than a conventional transmission and auxiliary, it is pointed out. Literature from Fuller Mfg. Co.

#### **NEW TRACTOR TIRE**

A new non-directional tractor tire, available in six sizes, has been announced by the B. F. Goodrich Co., Tire & Equipment Div., Akron, Ohio. Cited as suitable for various operating conditions found in loose or sandy soils where good traction and high flotation are needed, it may also be operated on the highway, in yards and driveways, both inside and outside of industrial plants, and on other jobs with relatively hard surfaces. The tire is now available in the following sizes: 11-28, 9-16 and 12-26, all 4-ply; 13-26, 14-26 and 15-26, all 6-ply.



#### NEW BALL-BEARING LINE HAS GREATER LOAD CAPACITY

A new series of ball bearings designed for medium-duty service conditions has been added to its "30,000 hour" line by the Dodge Mfg. Corp., Mishawaka, Ind. Designated as Dodge SCM ball bearings, they offer all the features and dependability of the service-tested Dodge SC ball bearings and in addition provide more load-carrying capacity and are available in larger shaft sizes. The new line includes both ball-bearing pillow blocks and ball-bearing flange cartridge mounts. Metallic-backed synthetic seals are mechanically anchored in position and will not blow under grease gun pressure, it is pointed out. The lubricant is effectively sealed in with dust and dirt excluded. A locking pin prevents rotation of the outer bearing race while allowing full self-alignment. Dodge SCM ball bearings are completely assembled, factory adjusted, pre-lubricated and ready to mount on the shaft. Both the pillow blocks and flange cartridge mounts are now available from factory and distributors' stocks in popular transmissions sizes, the company reports. New 52-p Bulletin A-638 with full data on both the SC and SCM lines is available from Dodge.



#### LIGHTWEIGHT CORE DRILLS

Sprague & Henwood, Inc., Scranton 2, Pa., has announced two new diamond core drilling machines, Model 30 and Model L-2, to meet the demand for compact units which can be moved easily from one location to another and can also be relied upon to produce good cores rapidly up to moderate depths. Both models can be powered by either diesel or gasoline, air or electric motor. Normally skid-mounted they also are available with an improved type of trailer mounting for easy portability without tying up a truck. A third option provides a complete self-contained core-drilling rig mounted on a 4-wheel-drive truck. Simplified design, alloy-steel gears, antifriction bearings and other modern features assure low-cost trouble-free operation, the company says. Literature from Sprague & Henwood.

#### TREATED FILTER CLOTH

New-type "M" treated cotton filter cloth is said by the maker to offer many advantages found in the synthetic fabrics at a cost close to that of untreated cotton filter cloth. It is resistant to many common chemicals and is highly resistant to mildew, shrinkage and wrinkling. This new product has been very successful in operations on plate and frame presses and on rotary vacuum filters where the combination of easy cake release, good chemical resistance and dimensional stability are important operating factors, the makers says. "M" treated cotton filter coth is said to offer good possibilities in dust-collection work where dust release is an important factor. Full data from the National Filter Media Corp., 1717 Dixwell Ave, New Haven, 14, Conn.

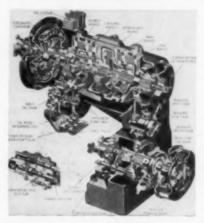
#### GREATER CORD LIFE

A new electrical cord for portable machinery, said to offer a service life three times longer than present highest quality cords, has been developed by United States Rubber Co., Rockefeller Center, New York 20, N.Y. Called the "U. S.

Laytex Royal Master Portable Cord," it is for use with grinders, drills, power saws, buffers and other heavy-duty portable electrical tools. It incorporates features new in cord construction and is rated by the maker as superior to the finest cord that could be made by combining the best qualities of existing mold-cured cords. It has 488% greater resistance to flexing than the average of present mold-cured cords, is 118% more resistant to tearing and has 197% greater impact strength, the company reports.

#### **NEW-TYPE SILICONE VARNISH**

A new type of silicone impregnating varnish - possessing greater physical properties at temperatures up to 250 C-has been announced by General Electric Co.'s Silicone Products Dept., Waterford, N.Y. Said to represent a significant advance in silicone-varnish technology, the new SR-60 has been developed for impregnating and bonding electrical equipment, such as, stator and armature coils, aircraft generators, dry-type transformers and glass-asbestos served wire. SR-60 resin is designed for application on Class H equipment, although its ability to cure at lower temperatures makes it suitable for Class B equipment. Actual tests with SR-60 on coils have shown it to be up to four times stronger at operating temperature than the conventional silicone varnishes hitherto employed, it is reported. Full details from G.E.



#### NEW TORQUE-CONVERTOR TRANSMISSION FOR INDUSTRY

A new Torquatic transmission, CRT 3330, designed especially for industry vehicles requiring forward and reverse operations in all speeds is announced by the Allison Div., General Motors Corp., Indianapolis 6, Ind. The new Torquatic drive may be used with gasoline or diesel engines in the 70- to 130-hp class. It has three speeds forward and three in reverse, with a wide range of applica-tion in loaders, graders and fork-lift trucks, combining the advantages of the Torquatic converter and quick-shift Torquatic transmission into one package for greater installation advantages. Tests have shown conclusively that this type of transmission speeds the job cycle, provides more work output and does it in less time, according to the manufacturer. The CRT-3330 consists of the Allison

# B.F.Goodrich



# Tires carry 40 tons of coal over 25,000 miles of rocks—ready for more

ONE of the world's largest strip mines is operated by the United Electric Coal Companies at DuQuoin, Illinois. Here fleets of trucks carry 40-ton loads of coal from rock-strewn pits over long haul roads made of abrasive slate. Tires could be chewed to pieces quickly, running up huge maintenance costs, running down production.

United avoids these problems with B. F. Goodrich tires, reports they have

UNIVERSAL TREAD resists rock cuts and bruises. Wedge-shaped cleats defy slippage, pull in either direction.

averaged 25,000 miles already with less than half their service life gone!

#### All-Nylon cord body

Universal tires can take this kind of punishment because they're now built with an *all-nylon* cord body (size 12.00 and larger, smaller sizes in rayon or nylon). Nylon is stronger than ordinary cord materials, can withstand double the impact and resist flex breaks.



**OVER-ALL VIEW** of the grant DuQuoin mine. It's one of 6 operated by United in Illinois and Kentucky.

Under the tread is the patented B. F. Goodrich nylon shock shield. Layers of strong nylon cords stretch together to absorb shocks and protect the tire body. Universal tires wear longer; more tires can be recapped. You pay nothing extra for this nylon shock shield.

See your B. F. Goodrich representative today and find out how you can get longer tire service at lower cost in your mine work. The address is listed under Tires in the Yellow Pages of your phone book. Or write The B. F. Goodrich Company, Tire & Equipment Division, Akron 18, Ohio.

Specify B. F. Geodrich tires when ordering new equipment





single-stage converter, the Allison quickshift range gearing and transfer gearing drop box with front and rear outputs, and built-in drive for the implement pump. A "Sense-Feel" 'ceature transm'ts, through the operator's control, the "feel" of the load pick-up, as in the engagement of a conventional mechanical clu'ch.



#### PORTABLE DRILL

The Toledo earth drill, mounted on a Jeep for mobility, combines rugged construction with relatively light weight, enabling operators to move the drill over rough terrain, through soft and muddy ground and into wooded areas. The drill can receive its power from a power takeoff of a vehicle or other power source. The unit in drilling position is moved out from the vehicle by a hydraulic system. Two jacks at the rear of the vehicle stabilize the vehicle and drill, keeping both level during the drilling operation. For road travel, the drilling unit is moved into the bed of the vehicle. The drill penetrates earth to a depth of more than 100 ft, and rock to a depth of more than 300 ft when using diamond bits. Additional information from Continental Equipment Sales, Inc., 1810 N. Twelfth St., Toledo, Ohio.



#### TIP-BACK BUCKET ON TRACTOR-LOADER

A larger bucket with 25-deg tip-back at ground level has been announced by Tractomotive Corp., Deerfield, Ill., for

its TL-10 Tracto-Loader. Formerly a 34cu yd unit, the completely redesigned bucket now has a capacity of a full cubic yard. The width of the bucket has been increased by 11/2 in, permitting it to be operated flush against walls and into corners. This feature, together with the machine's 11-ft turning radius, makes it ideally suited for most loading operations both indoors and out, the company says. The automatic tilting action during the raising cycle has been retained so that at the low carrying height of 3 ft the bucket is tipped back to an angle of 45 deg. The many advantages of the tip-back action and the resulting low carrying position include bigger loads, faster loading, better operator vision, increased ability to carry heaped loads without spillage and better over-all stability and balance, the company says.



#### HIGHER CAPACITY FOR INDUSTRIAL TRUCK BATTERIES

C & D Batteries, Inc., Conshohocken, Pa., has announced two new higher-capacity lines of industrial truck batteries, called the 66 and the 125, which feature C & D's "Five-Fold Slyver-Clad" construction said to virtually eliminate the need for sediment space. By filling most of the unneeded space with longer and thicker plates, C & D Slyver-Clad batteries provide 10% more capacity in the standard-size trays, according to the company. Details on batteries for rider and hand-type lift trucks in Bulletins IT-521/55 (rider) and IT-522/55 (hand type) from C & D.

#### ASBESTOS SHEET PACKING

A new asbestos sheet packing has been announced by the Thermoid Co., Trenton, N. J., to handle various industrial gasket requirements of industrial plants of all types, mines, etc. Designated as No. 90 sheet packing with a gray-black color, it is suitable for handling steam, hot and cold water, brine, air and oil up to 300 psi and 500 F. Average tensile strength of cross-laminated material is 4,500 psi, and for homogenous packing, 3,000 psi. Data from Thermoid.

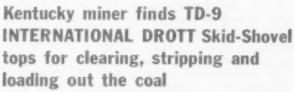
#### Equipment Shorts You'll Want to Check

INDUSTRIAL MICROPHONE— Femco offers a new microphone particularly suited to applications where the level of ambient noise is a factor or where dust or moisture is prevalent. It is offered as a close-talking microphone for use with almost any radio or wired-audio system. All internal parts are completely sealed against moisture and dust, and the exterior molding has been de-

# "My TD-9 Skid-Shovel Doubles Production"



BIG BITES of overburden like this go into the shovel every time with the TD-9 Skid-Shovel applying 11,500-pound break-out force—300% greater than equal-sized loaders—to scoop up shot rock, hardpan, and even small trees in the stripping operation.



Bryan Keith, Manchester, Kentucky, needs only one machine—a TD-9 INTERNATIONAL DROTT Skid-Shovel—to clear, strip and load trucks at his coal mine.

"With its break-out action and bucket rollback features my TD-9 INTERNATIONAL DROTT Skid-Shovel doubles the production of other equal-sized shovel loaders," the mine owner reports.

You be the judge of these amazing INTERNA-TIONAL DROTT mining tools. Just call your INTER-NATIONAL Industrial Power Distributor. He'll demonstrate the unit that is sized for your operation. And you'll see the equipment that has enabled mine operators everywhere to bobtail their operating costs while increasing production. Call today.

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS DROTT MANUFACTURING CORP., MILWAUKEE 8, WISCONSIN



41° BUCKET ROLL-BACK at ground level, an exclusive feature, keeps heaped loads like this in the 1½-yard bucket every pass. And the exclusive Skid-Shoes transfers loading and carrying strain into the ground, away from the crawler.



FASTER TRANSPORT of heaped loads is assured with a TD-9 Skid-Shovel since the overburden is semi-skidded at ground level in high gear—not in first. Exclusive Hydro-Spring takes 70% of shock loads out of bucket drop during loading.



INTERNATIONAL.

DROTT



Calumet Division, Calumet and Hecla, Inc., Calumet, Michigan

# "Cities Service Heat Prover Played A Major Role In Our Expansion Program"

Miners and refiners of copper, the Calumet, Michigan Division of Calumet and Hecla, Inc., relies on two power plants to operate its many mines, reclamation plants, mills, manufacturing facilities and mine rehabilitation projects.

The two plants, located at Lake Linden and Hubbell, were recently brought up to date. The Lake Linden plant now has modern steam generating equipment fired with pulverized coal. The Ahmeek plant was equipped with new coal distributors for its underfeed stokers and new plastic monolithic furnace settings.

This modernization program, along with a planned preventive maintenance program which is now being put into effect, is expected to raise the KW capacity of these plants from 20 megawatts to 30 within the next few months.

The Cities Service Heat Prover has played a major role in this improvement program. It is used extensively to examine combustion conditions in the furnaces, check station instruments, and guard against air infiltration through boiler

settings and duct work, thus enabling plant personnel to operate the equipment constantly at design efficiencies or better.

Says Power Superintendent, Robert Hein: "The portable Cities Service Heat Prover has proved invaluable in our operation. We are now using 150,000 tons of coal per year and operating at boiler efficiencies around 86%. By giving us a quick, accurate check on our firing conditions, the Heat Prover has been directly responsible for much of this record."

The Heat Prover is supplied and maintained free by Cities Service. For further information write Cities Service Oil Co., Sixty Wall Tower, New York 5, N. Y.



Calumet Reclamation Operation reclaims stamp sands processed years ago and dumped into lake. Further processing will extract copper. For power, dredge relies on the Calumet Division's Lake Linden Power Plant.



Taking Readings With Heat Prover has helped Calumet Division achieve 86% boiler efficiency. Will aid further in raising KW capacity from 20 to 30 megawatts. The unique instrument enables maximum heat benefits from coal.

CITIES ( SERVICE

DUALITY PETROLEUM PRODUCTS

signed to fit the hand comfortably. Additional information from Femco, Inc., Irwin, Pa.

SAFETY HOOK—Foolproof, positive locking Newco safety hook for hoists eliminates human element, since load cannot be lifted without the gate or yoke automatically locking. To open, the hook must be manually pressed against a compression spring. The yoke or gate is made of manganese-bronze alloy and prevents hook from spreading when overloaded. Full details from Newman Mfg. & Sales Corp., Box 5939, Kansas City 11, Mo.

WIRE AND CABLE of various types shipped on non-returnable reels has been inaugurated by the Rome Cable Co., Rome, N. Y., in the interests of better customer service. The durable new reel has 80% of the strength of the conventional returnable reel. It is expected to save customer handling, record-keeping and accounting.

HYDRAULIC HOSE, called Flexsteel hydraulic control hose, is wire-reinforced and available in sizes from \( \frac{4}{16} \) to 2 in, I. D. Depending on size, the hose handles pressures ranging up to 5,500 psi. Thoroughly field tested, Flexsteel hydraulic control hose is constructed to meet military, SAE and Rubber Manufacturers' Association specifications by Goodyear Tire & Rubber Co.'s Industrial Products Div., Akron 16, Ohio.

PROTECTIVE COATING—The Pennsylvania Salt Mfg. Co. announces a low-cost trial kit of "Thick-Coat," its new resin coating product for humid and corrosive atmospheres. The Thick-Coating for new or corroded metal, concrete and wood surfaces exposed to fumes, corrosive atmospheres and spillage of destructive chemicals, it is said. Details from Corrosion Engineering Dept., Pennsylvania Salt Mfg. Co., 1000 Widener Bldg., Philadelphia 7, Pa.

SHOP CADDY with four-speed hydraulic Varilift is a combination pallet-lift stacker and hand truck capable of lifting a quarter-ton, moving loads with perfect balance and stacking from floor level to 36 or 54 in. There are four models, 500-lb capacity, in platform sizes 16x20, 19x22 and 22x30 in. Full information from Allied Mfg. & Sales Co., 3113 W. Grand Ave., Chicago 22, Ill.

VALVES—For the first time in valve history, according to the Fairbanks Co., its new renewable-seat-ring gate valve assures replacement of seat ring in only 7 to 10 min under all conditions with merely a screwdriver, and with the valve body still installed in the line, an exclusive and patented feature. Previously, to replace seat rings the valve had first to be removed from the line. Offered in six sizes from ½ to 2 in. Bulletin from Fairbanks Co., 393 Lafayette St., New York 3, N. Y.

WATER PUMP—Its new "Big Flo Submerga" pump will deliver up to 100 gpm from a 4-in-diameter well, representing a new high in submergible-pump performance on this size well, according to the Red Jacket Mfg. Co., Davenport, Iowa. A high-efficiency, high-capacity pump for use where large quantities of water are required, it offers pumping from depths up to 300 ft. Folder from company.

ALUMINUM WELDING CABLE— New lightweight aluminum welding cable called "Tweco-Lite" has been announced by the Tweco Products Co., Wichita, Kan. Weighing only one-half as much as conventional copper welding cables, the new cable has great flexibility which makes it easier and less tiresome for the welders to do their jobs, the company says. Bulletin TL-107 from Tweco.

WATER-REPELLENT WORK SHOES that resist absorption of chemicals and filth while lasting longer is the promise of a new line of Sylflex tanned shoes and boots introduced by Red Wing Shoe Co., Red Wing, Minn. Sylflex is the newly developed Dow Corning silicone treatment which makes leather permanently water repellent and lengthens the life of shoes. The new shoes with Sylflex are offered in two styles: a 6-in shoe and an 8-in outdoorsman's boot, of high-grade glove leather.

EQUIPMENT LEASING under a new and easier method has been announced by the Morrison Plan, Inc., 814 Rand Bldg., Buffalo 3, N. Y. The plan enables users of heavy construction and railroad maintenance-of-way equipment to lease various types of equipment (produced by different manufacturers) in one transaction, the company says. The monthly payment plan avoids tying up working capital and offers certain tax advantages, it points out.

UPRIGHT STORAGE of large quantities of electrical conduit and other piping materials up to 10 ft long is now possible in a much smaller space with its new vertical conduit racks, reports the Frick-Gallagher Mfg. Co., Wellston, Ohio. The racks are individual units, require no fastening to the floor nor bracing to walls or ceiling.

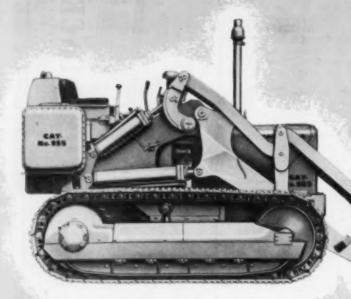
### FREE BULLETINS AVAILABLE

COAL-RECOVERY DRILLS — McCarthy Model 1400 series coal-recovery drills for coal production up to 500 tpd are described in a new 4-p Bulletin M-102, published by The Salem Tool Co., S. Ellsworth Ave., Salem, Ohio. The heavy-duty self-moving drills use 12-ft-long augers from 20 to 48 in in

diameter. Field installation pictures and specifications describe all models.

ELECTRIC TRACK SWITCH-THROWER—New 6-p Bulletin 1042 available from the Cheatham Electric Switching Device Co., Inc., Louisville 9, Ky., explains how Cheatham switch and





No. 955

14-yard capacity

Caterpillar

2 NEW

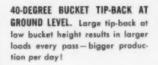


No. 933

1-yard capacity

### "BIG-PRODUCTION" FEATURES OF THE NEW NO. 955 AND NO. 933







NEW OIL-TYPE CLUTCH. Stands up under continuous, repeated use. Cuts maintenance costs and time two ways: (1) Clutch adjustment, while easy, is seldom required. (2) Plate replacement is often unnecessary even at engine overhaul.

Also helps step up production with easier shifting for operator.



CONVENIENTLY LOCATED LIFT AND DUMP LEVERS. All controls are within easy reach—bucket controls are a one-hand operation! "DESIGNED-IN" COMFORT. Operator sits high in a comfortable seat, with excellent visibility of all bucket conditions.

PERFECT BALANCE. Weight distribution, engine horsepower and bucket capacity are balanced so that the full length of the track stays on the ground with a heaped load in the bucket.

**NEW 3-GROUSER TRACK SHOES.** Tested and proved on tough jobs, they deliver better traction—longer life.

**OPTIONAL STARTING.** Your choice of 6-volt electric starting for starting engine or 24-volt direct electric starting—from the seat, either way.

VERSATILE ATTACHMENTS. Your job range is increased by a variety of buckets and other useful attachments.

BRIEF SPECIFICATIONS	No. 955	No. 933
Flywheel HP at sea level	70	50
Bucket capacity, cu. yd.	11/2	1
Bucket tip-back at ground level, degrees	40	40
Bucket tip-back at max. lift, degrees	471/2	48
Dumping height (center of hinge pin to ground)	128"	1181/2"
Weight (approx.) lb.	21,480	15,500

# TRAXCAVATORS



MODERN HYDRAULIC SYSTEM. Fullflow hydraulic system filter protects moving parts against obrasive particles in fluid. Filter handily located for easy replacement of element.

Hydraulically balanced vanetype pump insures delivery of full valume and pressure of ail for thousands of hours. Operating valves in

tank provide maximum protection against damage and dirt. Closed hydraulic system—no vents or breathers—prevents entrance of dirt.



HIGH REACH. Plus strong box section arms for rugged service. Boxtype cross brace prevents twisting or bending.

PLENTY OF POWER. Power is ample to "bury" the bucket and provide fast lifting action and positive dumping under all load conditions.

### BALANCED UNITS for BIGGER PROFIT!

Designed from the ground up as excavating and loading machines, these two new CAT\*-built Traxcavators\* are balanced for bigger production at lower cost. Built and backed by one manufacturer, they give you all the advantages of single manufacturing responsibility. With practical, advance-design features, they're engineered to outproduce ordinary tractor-shovels of the same capacity. You'll find these units the handiest tools in your line-up. Get the money-making picture from your Caterpillar Dealer—ask for a demonstration!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR\*



ANOTHER EXAMPLE OF CATERPILLAR LEADERSHIP IN ACTION

# describing a revolutionary new coal drying process that is both economical and safe! PARRY DRYER WORKER INC.

Turbulent Entrainment dries coal or lignite in seconds, with thermal efficiencies above 90% readily obtainable. Response to change in feed is instantaneous; final moisture content can be controlled to as little as 1%. Capacities up to 150 TPH of raw feed are practical for single units now in operation. The Parry Dryer handles all minus ½-inch sizes. Safety is inherent because an inert atmosphere is maintained under positive pressure throughout the drying system. Operation is continuous and can be automatically controlled. Get the full story now.

### SILVER ENGINEERING WORKS, INC.

3313 BLAKE STREET, DENVER 5, COLORADO

9 Outustrial and Process Machinery



### Slide Rules Simplify Conveyor-Belt Design

All the engineering data in a 40-p conveyor-belting notebook is incorporated in these two slide rules, a horsepower calculator and a carcass, or belt-fabric, calculator. With them, it is possible to design an original conveyor belt installation in 10 min, instead of the 3 hr it usually takes by working out involved engineering calculations. The rules were developed by the United States Rubber Co., Rockefeller Center, New York 20, N. Y., as a part of a conveyor-belt construction kit.

derail throwers increase the safety and efficiency of mine haulage. Construction, features and applications are discussed and illustrated.

MINE EQUIPMENT—48-p pocketsized Booklet 888 offers a quick, concise picture of the Jeffrey line of products and a brief outline of its facilities for producing a wide range of mining machinery and equipment. Varied Jeffrey products for coal mining, handling and preparation are illustrated. From the Jeffrey Mfg. Co., Columbus 16, Ohio.

HEAVY-DUTY TRACTOR—The new Euclid TC-12 twin-crawler tractor, powered by two 194-hp diesel engines, is described in Catalog 601 released by Euclid Div., General Motors Corp., Cleveland 17, Ohio. The catalog describes the tractor's revolutionary design, featuring two engines and separate Torqmatic drives for each track that give it a total of 365 hp delivered to the power train.

FIRST-AID KIT—The M-S-A Foille burn kit, for immediate treatment of all types of burns, is described in Bulletin 0402-3 from Mine Safety Appliance Co., 201 N. Braddock Ave., Pittsburgh 8, Pa. The kit consists of four 10-oz Foille Aerosol sprays and Type D first-aid dressings and accessories, contained in an all-weather case made of 20-gage steel.

DRIVES—Bulletin A-640 from the Dodge Mfg. Co., Mishawaka, Ind., offers 12 p of detailed data on the recently announced Dodge "Flexidyne" drive, the "Dry Fliud Drive" using a new principle said to start loads smoothly, protect against shocks and overloads, save power and provide 100% efficiency at full load. Full specifications, dimension and selec-

September, 1955 · COAL AGE

# It's Important to know if Your Bearing Source is



### Bearings, Inc. Sells ONLY Bearings and Bearing Accessories it is Authorized to Sell!

We have built our business on the belief that our customers wanted, first of all, SERVICE. To render that service we must be fully informed on bearing performance, quality and availability—The service only AUTHORIZED DISTRIBUTORS, working with and for the manufacturer can perform and you, the customer, have a right to expect. Only Au-

thorized Distributors carry complete stocks for immediate delivery. . . . Only Authorized Distributors have trained bearing specialists who will serve you best. . . . Only Authorized Distributors have the backing and support of the factory, engineering and research departments of the manufacturers he is authorized to represent. Don't settle for less.

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INDIANA: Ft. Wayn + Total anapolis + Muncie + Terre Haute NEW JERSEY: Camden
Subsidiary: Kentucky Ball and Roller Bearing Co Louisville, Ky.

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tion data are included for a wide range of applications.

MOTOR GRADER — Huber-Warco Co, Marion, Ohio, offers a new 12-p Bulletin HWG-508 on its new 5D-190—said to be the world's first motor grader to offer 195 hp and specially designed to handle heavy-duty grading jobs. A new 12-p Bulletin HWM-512 on the Huber-Warco "Maintainer" (Model M-52) also is available from Huber-Warco. It lists comprehensive specifications on both the Maintainer and its power units, with full details on each of the Maintainer's nine hydraulically controlled attachments.

MINER BITS—Leaflet describing a new line of Carmet mining-machine bits, known as "G" and "H" Series, reports experience on continuous miners demonstrating lower tool cost and reduced down time. The leaflet, complete with performance data, is available on request from the Carmet Div., Allegheny Ludlum Steel Corp., 2020 Oliver Bldg., Pittsburgh 22, Pa.

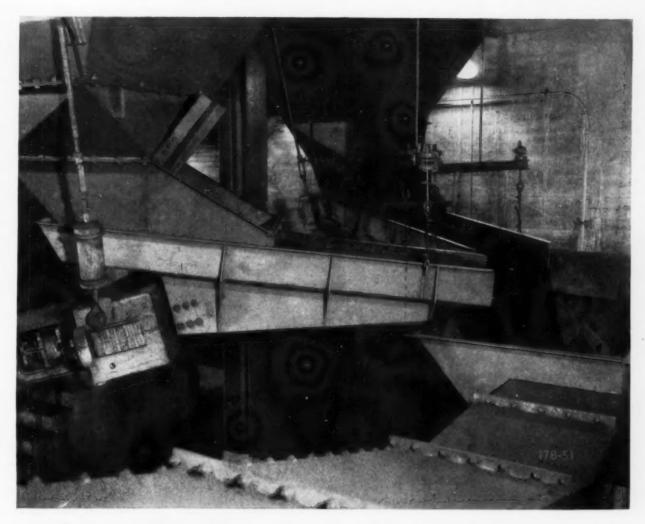
REAGENTS—Bulletin from the Mineral Dressing Dept., Américan Cyanamid Co., 30 Rockefeller Plaza, New York 20, N. Y., provides detailed application and performance data on its line of "Aerofloe" reagents, a group of synthetic polymers for flocculating finely divided solids in aqueous suspensions. Applications for treating coal washery discharges are among those discussed.

TRACTOR—The technical and operating story of its new HD-16 crawler tractor is now available from the Allis-Chalmers Mfg. Co., Tractor Group, Construction Machinery Div., Milwaukee, Wis. The brochure includes a pictorial review of design, engineering and operating advancements, specifications and matched attachments and accessories available.

OVERBURDEN DRILLS—Horizontal truck-mounted and self-propelled Mc-Carthy auger drills for earth and rock boring are featured in Bulletin M-105, published by The Salem Tool Co., S. Ellsworth Ave., Salem, Ohio. Powered by gasoline engine, diesel or electric motor, the drills bore up to 12-in-diameter holes to depths of 150 ft in earth formations. Drilling height ranges from 4½ to 7 ft.

FILTERS—New 16-p Denver Filter Bulletin FG-B1 describes Denver disc filters, drum filters and laboratory filters engineered to produce a drier filter cake through patented features, cut maintenance cost, reduce shutdown time, increase filtering area and to handle more than one product at one time. The Denver line of filters is described with complete data, specifications and illustrations. From Denver Equipment Co., P. O. Box 5268, Denver 17, Colo.

VARIABLE-SPEED DRIVES—Bulletin K-200 covers the Cleveland "Speed Variator" line of Type K drives in nine standard sizes with constant-horsepower input ratings, and the nine additional Type KL models for constant-torque applications. Descriptions, ratings, dimen-



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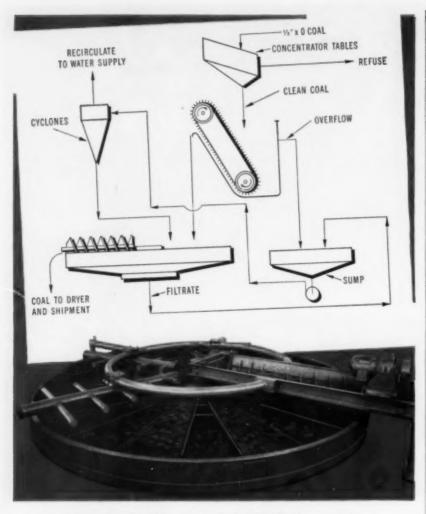
 $\mathbf{Y}^{\text{OU}}$  can solve many problems of conveying solid materials with Jeffrey Electric Vibrating Feeders. Move fine powders or huge stone blocks . . a few ounces or two thousand tons per hour . . . dripping wet or bone dry . . . at temperatures ranging from 30° below zero to 2,000° above. Materials are

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Jeffrey's years of experience with conveying problems enable us to furnish systems exactly right for each particular task. Catalog 870 describes the complete line of Jeffrey Vibrating Equipment. For a copy, and for help on your conveying problems, write The Jeffrey Manufacturing Co., Columbus 16, Ohio.





# Rochester and Pittsburgh Coal Company First to Recover Fine Cleaned Coal with Horizontal Filter

The recovery of ½" x 0, cleaned coal from suspension in water with minimum breakdown in size plus the elimination of stream pollution was the problem at the Ernest Plant of the Rochester and Pittsburg Coal Company.

The solution was provided by incorporating an Oliver Rotary Horizontal Filter, the first to be used in the coal industry, into the

Here's how it operates — A layer of coarser sizes is fed from the bucket elevator on the filter to make a preformed bed. Fine coal is then added including underflow coal slurry from the cyclones. The cleaned coal is then removed by a scroll. The result — maximum recovery of fines without carrying them through the circulating system, cleaner washery water of uniform density with no build up at the end of the week.

If you have a problem in the recovery of fine coal, Dorr-Oliver Engineers can be of help to you. Ask for their services; or for more information, write for descriptive lilerature.

WORLD WIDE PESSARCH . ENGINEERING . EQUIPMENT

sions and other engineering data on all models of the Cleveland Speed Variator are included. From the Cleveland Worm & Gear Co., 3249 E. 80th St., Cleveland 4, Ohio.

POOL WASHING SCREEN—Allis-Chalmers pool washing screens for handling a wide variety of materials are described in a new bulletin, which explains how the pool washing screen provides efficient wet screening and effective media recovery while conserving water, increasing screening capacity, minimizing blinding and promoting long screen surface life. Pool washing decks with recessed pools are available for single- and double-deck screens and can be applied to "Low-Head" horizontal and inclined screens. Bulletin 07B8214 from Allis-Chalmers Mfg. Co., 968 S. 70th St., Milwaukee, Wis.

COMMUNICATIONS SYSTEM—The M-S-A "Audio Safety System," an interplant or mine communications system, is described in a new Bulletin 1601-8 from Mine Safety Appliances Co., 201 N. Braddock Ave., Pittsburgh 8, Pa. Tailored to meet the needs of any installation, the system can be used to transmit repeated safety reports, instructions, announcements, and other information.

DRAINAGE — Bulletin from Armoo Drainage & Metal Products, Inc., tells how proper drainage structures stop trouble before it starts, featuring flexible strength to withstand live and dead loads, strong joints to withstand transverse pressures and soil movement, beam strength to resist soft spots in the foundation, all-metal construction to absorb frost action, and long lengths and strong, tight joints to prevent progressive undermining. Folder CMS 9555 from Armco's Product Information Service, Middletown, Ohio.

Reliance Electric & Engineering Co., 1088 Ivanhoe Rd., Cleveland 10, Ohio, offers Bulletin A-2406 describing the Reliance "Metermatic" pre-lubricated bearing design. Used on the company's AC and DC motors, the bearing design features the exclusive new metering plate that automatically regulates proper grease flow to the bearing and provides pressure relief against over-greasing, independent of plant lubrication schedules.

TRACTORS—The Oliver Corp., 400 W. Madison Ave., Chicago 6, Ill., offers separate 16-p bulletins describing in detail the features and applications of two of its crawler tractors. Bulletin A-1040 covers the Oliver OC-12 diesel crawler unit with a maximum drawbar hp of 45.1. Bulletin A-1041 discusses the Oliver OC-3 industrial crawler tractor, powered by a gasoline engine with a 21.85 drawbar hp.

FIRE EXTINGUISHERS—Details on Foamite Airfoam fire-extinguishing equipment for combatting various types of flammable-liquid fires is contained in a 36-p booklet published by the American LaFrance Corp., Elmira, N. Y. Booklet contains engineering data and other useful facts on Foamite Airfoam fixed fire-



# Dragline Gives 57% More Wear

Draglines take a real beating in the coal stripping operations of the C B & M Coal Company, Plains, Pennsylvania. Used for removing over-burden, the best Improved Plow Steel draglines lasted 525 hours. When new TRU-LAY VHS draglines were used they established service records of 825 hours—57% better than Improved Plow Steel.

### FOR SLUSHER ROPES, SHOVEL HOIST ROPES

TRU-LAY VHS was specially developed for use as draglines, slusher ropes,

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New TRU-LAY VHS is at your American Cable distributor, <u>now.</u> See him, or write to the nearest American Chain & Cable Company office listed at right for Brochure DH-489 and shovel hoist ropes — the toughest applications in the mining field. It is 15% stronger than Improved Plow Steel which, up to now, has been the best grade procurable. This extra strength enables you to handle heavier loads with the same diameter line — gives a higher factor of safety during the entire period of service.

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New vhs is made of tougher, more wear-resistant wire. This pays off in longer service under the gruelling conditions that slusher ropes, draglines and shovel hoist ropes encounter.

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New VHS adds extra strength, toughness and wear resistance to the advantages of Preformed construction.
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## Cuts installation costs through fast assembly...assures locked-in tightness

MINE OPERATORS have found that Transite® Mine Service Pipe offers many advantages in addition to its long service life. Now with the new Ring-Tite® Coupling, pipe goes together faster, assuring even greater savings in installation.

### **Proven Corrosion-Resistance**

Over a period of many years' service, asbestos-cement Transite Pipe has proved its ability to stand up underthe corrosive action of acid mine drainage water. It is light in weight and easily handled. Lines are quickly assembled, even in restricted mine passages. The new Ring-Tite Coupling forms a tight, yet flexible joint that permits deflections of up to 5° at each coupling.

Available for working pressures up to 150 lbs. per square inch and in a full range of diameter from 4 inches up, Transite is also a money-saving pipe for many other mine uses.

For complete information about the new Ring-Tite Coupling and about Transite Mine Service Pipe write for Brochure TR-51A and TR-142A, Johns-Manville, Box 60, New York 16, N. Y.



# Johns-Manville TRANSITE Mine Service Pipe

protection systems, portable equipment and semi-portable equipment.

STEELS—A new publication by United States Steel, "Design Manual for High Strength Steels," is a 174-p practical working handbook for architects and engineers, compiled to fill a need growing out of the development and widening applications of high-strength low-alloy steels. Included is all the technical information needed by an engineer when he contemplates the use of high-strength steels, with numerous charts and formulas, not only for high-strength steels, but also for structural carbon steel. Nomographic or alignment charts eliminate much of the time formerly spent in design calculations. The book (Publication ADVL-215.54) is available to qualified engineers and architects from U. S. Steel Corp., 525 William Penn Pl., Pittsburgh, Pa.

ELECTRIC GENERATING PLANTS

—The Ready Power Co., 11231 Freud
Ave., Detroit 14, Mich., offers 12-p
Bulletin 279-2 covering its complete line
of stationary and mobile electric plants
from 1 to 100 kw, AC or DC, operating
on gasoline, diesel, natural gas, butane
or propane fuel. Full data on design,
features and applications are provided.

SLING CHAINS—Catalog S-555 offered by the Campbell Chain Co., York, Pa., provides all the necessary information for ordering each type of sling: single, double, triple and quadruple. Specifications, illustrations and working load limits for all three grades, Cam-Alloy, High Test Steel and Wrought Iron, are provided, with data on miscellaneous types and attachments.

HARD SURFACING—New folder provides details on a new line of tungstencarbide hardsurfacing weld rods and their application. Offered by Coast Metals, Inc., Little Ferry, N. J.

GEARS, SHAFTS—Two bulletins are available from Detroit Bevel Gear Co., 8130 Jos. Campau, Detroit 11, Mich. An 8-p booklet shows detailed information on the company's complete gear and axle shaft lines, which includes spur, helical, spiral bevel, hypoid, straight bevel, Zerol, flywheel ring gears, and spline shafts. Booklet on the Almetal universal joint and drive shaft discusses the advantages of the company's line of exclusively designed needle-bearing universal joints.

COLLOID DISPERSIONS—A revised 4-p booklet, listing 44 colloidal and semicolloidal dispersions for operational functions, maintenance, lubrication, machine design, and other industrial applications, is offered by Acheson Colloids Co., including dispersions of graphite, molybdenum disulfide, mica, vermiculite, zinc oxide, and acetylene black. Carriers, diluents, applications and important physical data are given for each. Eight new dispersions have been added to Acheson's product list, including a corrosion-resistant coating for dry-film lubrication. Write Acheson Colloids Co., Div. of Acheson Industries, Inc., Port Huron, Mich.



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pH-ilm Strength . . . 50,000 psi minimum.

Adhesiveness . . . Affinity for metal develops maximum adhesion

providing permanent coating on gears.

Water Repellence . . . Effectiveness is not reduced by water. Corrosion Prevention . . . Never acidic and will not etch or corrode.

Compounded Stability . . . Will not bleed or change physical condition

within a greater temperature range.

Low Temperature Factors . . . Does not harden, crack or decrease in adhesion. Abrasive Resistance . . . Repellent to adhesion of scale, metallics and other contamination.

# NEWS ROUND-UP

### Miners Win \$2 Pay Raise

A RECORD \$2 A DAY pay increase for northern workers of the nation's bituminous miners was agreed on by the United Mine Workers of America and the Bituminous Coal Operators' Association during negociations that ended in Washington Aug. 20. The new contract affects more than 120,000 bituminous miners and will cost the industry an estimated \$39,000,000 annually.

Under its terms, miners will receive \$1.20 more a day in their pay checks from Sept. 1, 1955 to April 1, 1956, when 80c more will be added. The increase will push miners' basic pay up to \$20.35 a day, a wage level that ranks with auto and steel industry pay scales. As the largest pay raise ever won by John L. Levis and his mineworkers, the increase surpusses by 10c the \$1.90 won in 1952.

After signing the agreement, Mr. Lewis, president of the UMWA, jovially hailed the contract as an "instrument with edible virtues. Mine workers," Mr. Lewis said, "require strong meat and eating money will produce more coal."

Harry M. Moses, head of the coal association, signed the contract for the operators, commented that the terms were "generous," and added that the new costs would be reflected in higher prices for coal consumers. How much higher would be "impossible to estimate," he appended.

The new agreement, which supplants one signed in 1952, covers some 60% of the coal industry, including those mines owned by steel companies, the so-called captive mines. It does not affect mines owned by members of the Southern Coal Producers' Association. But Mr. Lewis, optimistic over his latest successful nego-

tiations, was certain that terms could be reached easily with the southern operators. He said he hoped to "open negotiations in an informal manner with the southern operators as soon as possible." If the informal negotiations failed, Mr. Lewis said formal notice would be served. Under the terms of an existing agreement southern operators would have 60 days to conclude a contract or face a work stoppage.

Less than a week later, Aug. 26, the southern producers agreed to identical terms. Joseph E. Moody, president of the southern mine group, said he had no choice but to sign an agreemnt identical to the north's or face a strike. Mr. Moody forecast production cost increases of 48c to 52c a ton and predicted a contraction of the bituminous market.

Although the record wage increase in the north overshadowed other terms in the contract, the miners were granted other important provisions. Among them were time and one-half for Saturady work and double time for Sunday, regardless of time worked earlier in the week. Prior to the new agreement a miner could not begin to collect overtime pay unless he had worked 5 days in a week.

Another provision raised paid vacation time from 10 days to 12. Under the old agreement a miner received a flat \$100 vacation pay. That rate was raised to \$140

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# Coal to Power Huge Increase In Primary Aluminum Capacity

The Reynolds Metal Co. has announced plans to increase its primary aluminum capacity from 830,000,000 to 1,100,000,000 lb a year. The main part of the program is to be a new 200,000,000-lb primary production plant in the Ohio River Valley. Plans call for using coal as a source of power at this plant instead of hydroelectric energy as in most existing aluminum production.

The Ohio River facility will have a 300,000-kw power station using coal from adjacent company-owned deposits. To supply the fuel, mining facilities capable of producing more than 1,000,000 tons of coal a year are planned. Commenting on this feature, Richard S. Reynolds Jr., president, said:

"An interesting by-product of this expansion program is the emergence of coal as a major source of electrical energy for aluminum production. With vast deposits available in the United States, the improved efficiency of the latest coalburning equipment is another assurance that this country can economically increase its primary aluminum output to meet growing long-range market requirements."

The entire expansion effort will cost about \$230,000,000. Of that amount, some \$200,000,000 will go for the 270,000,000-lb expansion of primary produc-

ing and related facilities, including new bauxite mines in Haiti and Jamaica, and the coal-burning power plant.

### Minimum Coal Pay Set By Labor Dept. Order

Secretary of Labor James P. Mitchell Aug. 3 issued a minimum wage order for soft coal mined on government contracts. He proposed rates in virtually all areas at the levels paid to members of the UMWA. The rates will take effect 30 days after Aug. 6, when the order was to be published in the Federal Register. Objections to the decision will be received up to the effective date.

The rates range from \$1.40 an hour in Iowa to \$2.346 in Montana. In regions producing four-fifths of the country's coal the wage minimum would be \$2.245. These regions include Pennsylvania, Maryland, Virginia, West Virginia, eastern Kentucky, northern Tennessee, Ohio and Illinois. The Secretary of Labor followed the UMWA contract pattern in all areas except Iowa, where relatively little coal is produced and miners are largely unorganized.

The proposed rates will apply only to government contracts for the purchase of coal entered into after a specified date

### Bituminous Coal Output Still Climbing

YEAR TO DATE	PRODUCTION
Aug. 13, 1955	274,223,000 tons
Aug. 14, 1954	227,448,000 tons
1955 output 20.6%	ahead of 1954
A month earlier, the 1955 output was 19.	
WEEK ENDING	PRODUCTION
Aug. 13, 1955	9,320,000 tons
Aug. 14, 1954	7,865,000 tons



It doesn't take this ad to tell you how tremendously expensive mining machinery is. But it does take a lubricating expert to be sure you're giving that machinery complete, effective protection against wear and break-downs.

That's why Amoco mine lubrication engineers are so popular throughout Amocoal territory. They know their job . . . they can save you money, protect your machinery . . . and their service to you is free. Call or write your nearest Amoco office to learn how you can put one of these experts to work for you!



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subsequent to issuance of the final order. Auxiliary employees will be exempted from the minimum wage determination. The order as proposed provides that minimum wage obligations for tonnage workers will be met if a majority of tonnage workers in the mine earn the minimum rate and the average earnings of the group exceed the minimum. A special provision is added to take care of a mine which runs into abnormal conditions.

The action was initiated by Mr.

Mitchell last December in response to requests from John L. Lewis, president of the UMWA; George H. Love, president, Pittsburgh Consolidation Coal Co.; and A. R. Matthews, president, Pocahontas Fuel Co., Inc. Lengthy hearings were held by a Labor Dept. examiner early this year. Primary target of the action is the Tennessee Valley Authority, which has been charged with depressing the industry in general by purchasing coal from mines operating with substandard wage scales and safety.

& Tube Co. The new coke battery, expected to be in operation by September, 1956, will require about 65 employees, It will be the fourth at the Indiana Harbor Works and will feature underjet-fired combination ovens with additional by-products and benzol equipment, and improvements to the existing coke and coke handling equipment. The new battery will convert about 1,800 tons of coal into 1,250 tons of coke daily.

### News Briefs and Trends

### Anthracite Drainage Program to Start

President Eisenhower Aug. 5 signed a \$200,000 supplemental bill for administration of Pennsylvania's \$17 million anthracite mine drainage program. Rep. Daniel J. Flood, sponsor of the supplemental measure, said that the supplemental measure "permits work to start right away." Mr. Flood was also sponsor of the federal bill which has appropriated \$8.5 million for the mine drainage project. These funds match an equal amount which has been authorized by the Commonwealth of Pennsylvania.

### Ammonia Plant Using Coke Gas May Start New Trend

Heavy construction is expected to start this fall on the anhydrous ammonia plant at the Geneva works of U. S. Steel's Columbia-Geneva Steel Div., near Provo, Utah, according to an announcement by the Chemical Plants Div., Blaw-Knox Co., which is designing and will build the plant. The anhydrous ammonia installation is said to be the country's first in a major steel plant using raw coke-oven gas as the source of hydrogen for ammonia synthesis essential to national defense. It is expected to start a new trend in coal-chemicals recovery and to provide a significant contribution to the regional economy of the intermountain and northwest area. The plant will have a capacity of 200 tpd of anhydrous ammonia.

### **PP&L Plans Atomic Power Plant**

Charles E. Oakes, president, Pennsylvania Power & Light Co., announced July 29 that the company had decided to build a privately-financed atomic-electric power plant of at least 150,000 kw, using the homogeneous-type reactor. It is believed that such a plant will be commercially competitive with generating systems using conventional fuels. The inservice date for the new unit is planned Mr. Oakes said that a confor 1962. tract had been entered into with the Westinghouse Electric Corp. as co-developer with PP&L in the design of, and as supplier for, the pioneering reactor and its related electric generating equipment. The joint program will be known as the Pennsylvania Advanced Reactor Project (PAR).

### House Passes Harris Gas Bill

By a vote of 209 to 203, the House approved July 28 the Harris bill (H. R. 6645) to remove federal controls from independent producers of natural gas and to permit interstate transmission companies which produce their own gas to base their rates on the reasonable market price of such gas. The bill contains provisions designed to protect consumers against prices paid for gas in excess of the reasonable market price. The bill now is pending in the Senate when it returns.

### New Coke Battery Started For Youngstown Sheet & Tube

Construction by the Koppers Co. of a new battery of 75 coke ovens was scheduled to start late in August at the Indiana Harbor Works of the Youngstown Sheet

### Single Sample Held Basis For Gassy Classification

The Federal Coal Mine Safety Board of Review, in the case of Harlan-Wallins Coal Corp. v. director, USBM, held July 30 that a single air sample is a sufficient basis for classification of a coal mine as gassy. The decision stated in part as fol-"The language of the act is so specific in this regard as to admit of no reasonable doubt concerning the intent of Congress. Section 203d provides that a gassy classification order shall issue if methane is found by air analysis in an amount of 0.25% or more in any open workings of such mine when tested at a point not less than 12 in from the roof, face or rib.' Similarly, in Section 206c, on an appeal to the director from an order issued by an inspector pursuant to Section 203d, the director is required to find 'whether or not methane was found in such mine in an amount of 0.25% or more in any open workings of such mine, when tested at a point not less than 12 in from the roof, face or rib, at the time of the making of such an order.' Substantially the same language is used in Section 207h with reference to an appeal

Continued on p 132

### Pitt Consol Buys Chemical Plant; To Use Coal-Carbonization Products

Pittsburgh Consolidation Coal Co. announced Aug. 17 the acquisition of the Newark, N. J., plant of the Reilly Tar & Chemical Corp., which will be used to establish a modern cresylic acid refinery. Joseph Pursglove Jr., vice president of research and development, said that construction of new facilities and renovation of certain existing units would start immediately and that the over-all investment will be \$3 to \$3.5 million. The Newark plant will be operated by Pitt Consol's newly formed subsidiary, Pitt-Consol Chemical Co., which Mr. Pursglove heads.

A key factor in the development, Mr. Pursglove stated, has been Pitt Consol's research in coal carbonization and refining of the liquids obtained. This has resulted in a process for producing a new high quality cresylics and related materials. "While the process will enable us to use petroleum refinery waste streams as the primary feed material, the Newark plant will also provide an outlet for the most valuable fractions of liquids from coal-carbonization plants. Our process of low temperature carbonization is now ready for commercial use. As such projects materialize, the liquids from

carbonization plants can form the basis for further expansion of our chemical refining operations."

Products from the new plant initially will include high purity cresols, cresylic acids, phenol, resins and molding powders. There is a concentrated market for these materials in the chemicals and plastics industries on the eastern seaboard. "Other products for this operation are being developed," Mr. Pursglove said, "and we expect to make additions to the Newark product list from time to time."

General manager of the new firm will be Ralph H. Martin. Benjamin W. Jones will be sales manager. Messrs. Martin and Jones are from Pitt Consol's Research and Development Div. and have been active in planning the Newark operation.

The plant will have excess steam capacity and the 48-acre site has ample space for future expansion. The property has its own deep-water dock frontage, is served by rail, and is close to the New Jersey turnpike. The new facilities will begin operations in mid-1956 but a portion of the old plant will be operated meanwhile to produce present grades of cresylic acids, resins and molding powders.



These heat exchanger tubes

### Protect this motor from dirt and corrosic

3600-rpm explosion-proof motor with fan housing removed to show unidirectional fan.

COOLING AIR is carried through the heat ex-Cooling Air is carried changer tubes with sufficient velocity to expel practically all kinds of dirt. If oily or sticky dirt should cling, tubes can be ramrodded clean on the spot in a few minutes because tubes are straight and tube ends are exposed. Also, the tubes are distributed uniformly around the perimeter of the stator yoke and along its full length - cooling all parts of the motor evenly.

### Choice of Corrosion-resistant Materials

You can lick corrosion with this motor, too. Tubes are available in a variety of materials to meet practically any corrosive atmospheric condition. Allis-Chalmers tube-type motors have long and successful experience in such difficult applications as caustic plants, refineries and petrochemical plants, power plants with fly ash problems and many others.

### **Get Complete Information**

Next time you need a motor for a dirty or corrosive location or for outdoor operation in all kinds of weather, call your Allis-Chalmers District Office. Get complete information on Allis-Chalmers tube-type totally-enclosed, fan-cooled and explosion-proof motors. Or write Allis-Chalmers, Milwaukee 1, Wisconsin, for Bulletin 51B7149. Available in ratings on frames larger than NEMA 505 up to 3000 hp.

### LLIS-CHALMER

# ODM Asks Oil Companies To Report 1955-56 Imports

Director Arthur S. Flemming, of the Office of Defense Mobilization, asked 20 oil companies to report by Aug. 19 on their imports of crude, residual and refined products in the first 7 mo of this year and their planned imports through the first half of 1956. Mr. Flemming acted on the recommendation of the Cabinet-level Advisory Committee on Energy Supplies and Resources Policy.

The action also followed closely upon a letter to Mr. Flemming by 27 senators, in which they asked what action he would take to hold oil imports within the levels set by the President and Con-"As senators interested in national security and expanding production of domestic natural resources, we have observed with growing concern the increasing rate of imports of petroleum from foreign sources with relation to domestic production," they wrote. "For the first 6 mo of 1955, this ratio was substantially above that of 1954, the level recommended by the President's Cabinet Committee on Energy Supplies and Resources Policy."

The senators pointed out that the recent extension of the Trade Agreements Act was adopted by Congress with the understanding that the executive branch of the government would take whatever action was necessary to prevent oil im-

ports from exceeding the levels recommended by the special cabinet committee.

ODM officials said that the request for information on oil imports is a "preliminary, fact-finding step." They declined comment on what steps may be taken after the information is received and appraised.

The Independent Petroleum Association of America described Mr. Flemming's order as "the first major step toward implementing the Defense Amendment to the Trade Agreements Act." The association added: "This is a prerequisite step toward presidential action which would lead to the correction of the continuation of excessive imports over and above the level recommended by the cabinet committee."

### Gulf Area to Get First Major Coal-Fueled Power Plant

The Tampa Electric Co., Tampa, Fla., has announced that it will use coal to fuel its new Black Point plant, scheduled to begin operations in the spring of 1957. Company officials said that it would be the first major utility in Florida and the Gulf area to use coal for electric power production. TECO, one of Florida's largest private uitlity firms, has been using oil in its power plants since 1917.

In making the announcement, W. C. MacInnes, TECO president, said the company was prompted to investigate the possibility of using coal after the increasing cost of oil endangered stable power rates in the area. Though no appreciable difference in rates will be

noticed at first, the utility executive stated that the use of coal will guard against cost increases in the future and may well enable lowering rates later.

The power company is entering into a contract with the Nashville Coal Co., Uniontown, Ky., for a 20-yr supply of coal. The coal firm will use six barges, each with a capacity of 3,500 tons of coal, to transport the fuel from Uniontown to the Black Point plant, about an 8-day trip. When the first two units of the plant are in operation, they will use about 750,000 tons of coal a year and produce about half of the kilowatt hours of the company. Further use of coal will depend upon the suitability of the operation.





### P & M Holds Safety Banquet

RECOGNITION to winners of the annual safety contest and to all employees who had worked a full calendar year without a lost-time accident was given by the Pittsburg & Midway Coal Mining Co., Pittsburg, Kan., at its annual safety banquet held in July. In left photo standing, J. J. Forbes, director, USBM, and guest speaker for the occasion, is shown with Kenneth A. Spencer, P. & M. president, and F. W. Brinkerhoff, editor,

Pittsburg Publishing Go. In right photo, Mr. Forbes is congratulating electrician Ray Charlton, P. & M. award winner, while Edwin Phelps (back to camera), vice president in charge of operations, and F. J. Foresman, director of industrial relations, look on.

Winner of the 1954 safety contest was the Excavating Div., with a record of no lost-time accidents. Presentations to employees included awards to 67 who had no lost-time records for 9 yr and to others who had a similar achievement for more than 1 yr. The company's program for individual safety awards is now in its ninth year.

The accident experience for the entire mine was four lost-time accidents totaling only 20 lost man-days. The property's severity rate for the year was 0.10. The national average severity rate during the same period was 4.79.

# BEARING TROUBLES?



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METERMATIC .... the

Automatic Grease Monkey

I found out how to put an end to burned out bearings from the Reliance Metermatic Bulletin, A-2406. Why don't you write for one?





RELIANCE ELECTRIC AND ENGINEERING CO.

Cleveland 10, Ohio . Offices in Principal Cities



J. J. FORBES, DIRECTOR, USBM, reads the citation of the Certificate of Honor presented to the Jones & Laughlin Steel Corp. Watching are: C. L. Austin (left), J&L president; David Page and Thomas Park, general superintendent and safety director, respectively, J&L's Vesta-Shannopin Div.; and H. T. Bartram, general superintendent, Black Eagle mine, Mullens, W. Va.



PARTICIPATING in the award ceremonies are: Adm. Ben Moreell (left), chairman of the board, J&L; J. J. Forbes, director, USBM; Harry M. Moses, president, BCOA; Joseph Yablonski, international executive board member, UMWA; C. L. Austin, president, J&L; William E. Hess, manager, coal mines, J&L; and Lewis G. Evans, deputy secretary of mines for Pennsylvania.





GENERAL SAFETY AWARD was made to J&L's Vesta Nos. 4 and 5 mines. Three mines received individual Holmes Safety Association Certificates of Honor, Shown above are M. A. DePietro (left) superintendent, J&L's Shannopin mine; Michael Honus, secretary-treasurer, Dist. 4, UMWA; and J. J. Forbes, director, USBM.

KEY ROLES in J&L's safety program are played by William E. Hess (left, right photo), manager, coal mines; E. R. Cooper, general manager, coal mines; and C. L. Austin, president of the corporation.

### J&L Mine Sets New Safety Record

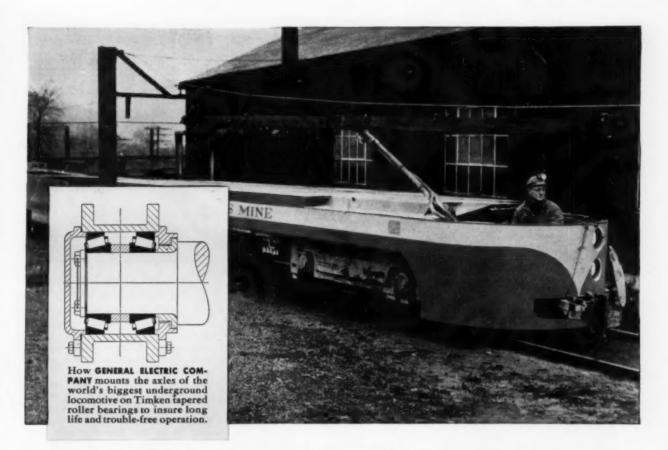
A NEW NATIONAL SAFETY RECORD for tonnage of coal mined without a fatal accident has been established by Jones & Laughlin Steel Corp.'s Vesta No. 4 mine, California, Pa. The record is for mining 7,111,605 tons without a fatal accident as of July 28. This non-fatality period started Oct. 11, 1951, and is continuing.

Announcement of the record was made July 28 at a dinner at the Nemacolin Country Club, near California, Pa., where all the J&L mines received the Joseph A. Holmes Safety Association award for having produced 7,967,039 tons of coal without a fatality. Three of the mines received individual certificates of honor.

More than 200 persons attended the dinner, including representatives of the USBM, Pennsylvania State Dept. of Mines, UMWA and Bituminous Coal Operators' Association. Among the speakers were Adm. Ben Moreell, chairman of the board, Jones & Laughlin Steel Corp.; C. L. Austin, J&L president; Harry M. Moses, president, Bituminous Coal Operators' Association; Joseph Yablonski, international executive board member, UMWA; Lewis G. Evans, deputy secretary of mines, Commonwealth of Pennsylvania; E. R. Cooper, general manager, J&L coal mines; and Charles Ferguson, safety director, UMWA.

J. J. Forbes, director, USBM, who presented the safety awards, pointed to the J&L mine safety record as "outstanding." He said it was a far cry from the days when the mining of 300,000 or 400,000 tons of coal without a fatality was considered a good safety record.

The previous national safety record for tonnage of coal mined without a fatal accident was held by U. S. Fuel Co.'s No. 2 mine, Gary, W. Va., for 6,770,083 tons of production from July 1, 1939, to April 15, 1944. Third place is now held by Island Creek Coal Co.'s No. 7 mine with 6,751,947 tons and fourth is Eastern Gas & Fuel's Federal No. 1 with 6,378,-874 tons.



# World's biggest underground mine locomotive rolls on 16 TIMKEN® bearings

THE world's largest and most powerful under ground locomotive, built by the General Electric Company, is now in operation pulling probably the largest coal loads ever hauled by a single unit locomotive. With a rated drawbar pull of 25,000 pounds, this locomotive is capable of pulling 1600 tons, or the equivalent of approximately 110 loaded mine cars, on a straight, level track. To insure against costly breakdowns in the mine and to help the locomotive stand up under the back-and-forth, day-after-day wear and tear of heavyduty mine operations, General Electric used Timken® tapered roller bearings on the axles.

The tapered construction of Timken bearings lets them take thrust as well as radial loads, without the need for extra thrust plates or bearings. The locomotive takes curves easier. By holding hubs and axles concentric, Timken bearings make closures more effective. Lubricant stays in—dirt, coal, dust and moisture stay out.

Full line contact between rollers and races of Timken bearings provides more than enough capacity for heavy loads.

Be sure you specify Timken bearings in the equipment you buy or build. They give longer life, less friction, minimum maintenance. Always look for the

trade-mark "Timken" stamped on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".



This symbol on a product means its bearings are the best.

### OUR OWN NICKEL-RICH ALLOY STEEL MAKES TIMKEN BEARINGS TOUGHER

Nickel makes steel tougher. And we don't skimp on nickel in the fine alloy steel we make for Timken bearings. Our steel-making specialists use the exact amount to give Timken bearings the toughness they road to withstand shock, last longer. We control the quality of Timken bearings at every step in production—from melt shop through final bearing inspection.

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TAPERED ROLLER BEARINGS



NOT JUST A BALL O NOT JUST A ROLLER THE TIMKEN TAPERED ROLLER

BEARING TAKES RADIAL (1) AND THRUST - (1) - LOADS OR ANY COMBINATION -



### **Personal Notes**

J. S. Wells, formerly production engineer, has been promoted to division manager, high volatile div., Coal Div., Eastern Gas & Fuel Associates, with head-quarters in Glen White, W. Va. He fills the vacancy caused by the dath of W. D. Hawley. Joining EG&FA as a mine worker in 1930, Mr. Wells held posts as section foreman, general mine foreman, superintendent and general superintendent at various company properties before becoming production engineer. In his new post, Mr. Wells will be responsible for the operation of Kopperstown, Wharton Nos. 1 and 2 and Beards Fork mines.

Carroll F. Hardy, chief engineer, Appalachian Coals, Inc., Cincinnati, Ohio, has been appointed director of sales engineering for the National Coal Association, effective Sept. 1. In making the announcement, Tom Pickett, NCA executive vice president, said that Mr. Hardy



Alabama By-Products Names Dyar General Superintendent

GROSVENOR C. DYAR has been appointed general superintendent of mines, Alabama By-Products Corp., Birmingham, Ala., according to an announcement by P. H. Neal, president. A graduate in engineering of the University of Alabama, Mr. Dyar joined Alabama By-Products Corp. in February, 1953, as superintendent of its Maxine mine. Wilfred E. Self has been appointed superintendent to succeed Mr. Dyar at Maxine mine. Prior to this appointment, Mr. Self had been superintendent at the company's Bradford mine and earlier held the same post at its Barney mine. Kenneth Dale, formerly general mine foreman at Maxine, has been appointed superintendent of Bradford mine. Previously he had been superintendent of the company's Barney mine.

would head the new Dept. of Sales Engineering, which will take over some of the work done by the association's Coal Heating Service during the past several years. The department will handle NCA's program to promote the marketing of coal and its efficient utilization.

Fred F. Stewart, Hazard, Ky., has been named superintendent of the No. 2 mine, Blue Diamond Coal Co., Tilford, Ky. He had been superintendent of Jewell Ridge Coal Co., also at Tilford.

Following the acquisition of the Sinclair Coal Co. by Peabody Coal Co. in July, new Peabody officers elected included Merle C. Kelce, executive vice president; Frank J. Hoyne, H. C. Mc-Collum, and R. J. Snider, vice presidents; E. L. Larson, treasurer; W. G. Blood, secretary; and K. Dawson, auditor.

Frank E. Cash will retire Oct. 8 after 33 yr in the mining and safety divisions of the USBM. While serving the mining, petroleum and allied industries as mining and supervising engineer, he was located at Pittsburgh, Pa.; Birmingham, Ala.; Duluth, Minn.; College Park, Md.; and Washington, D. C.

### **Association Activities**

### Fuels Research Elects; Hits Gas Expansion

At the annual meeting of Fuels Research Council, Inc., held in Philadelphia, Pa., July 26, president F. A. Fontyn announced that the following had been elected to the Board of Directors: F. A. Fontyn, Ebensburg Coal Co.; C. A. Owen, Imperial Coal Corp.; F. W. Earnest, Jr., Anthracite Institute; F. K. Prosser, Norfolk & Western Ry. Co.; E. J. Kerr, Baltimore & Ohio R.R. Co.; H. W. Large, Pennsylvania R.R. Co.; and H. B. Light, Reading Railway System. The board elected the following officers: F. A. Fontyn; president; C. A. Owen, vice president; C. C. Crowe, NCA, treasurer; and Robert E. Lee Hall, NCA, secretary. T. J. McGrath was reappointed general counsel.

Fuels Research Council, Inc., would continue its work in the field of competitive fuels with particular emphasis on opposing any unwarranted expansion of natural gas service in the United States, Mr. Fontyn stated. It was indicated that the coal, railroad and labor groups supporting the council's aims have expressed disappointment that the Federal Power Commission has failed to exercise sound principles of conservation in the administration of the Natural Gas Act. This has brought an unfair competitive burden on the coal industry in its fight for a fair share of the energy market. Mr. Fontyn said that the use of natural gas for boiler fuel was not in the public interest because of the ex-



### Lammers Chief Engineer For Appalachian Coals

H. B. LAMMERS has been appointed chief engineer, Applachian Coals, Inc., Cincinnati, Ohio. Bringing to ACI a background of 30-yr experience in fuels and combustion in the utility, industrial and commercial fields, Mr. Lammers fills the vacancy left by Carroll Hardy's resignation to become director of market promotion for the National Coal Association. For the past 10 yr Mr. Lammers has been chairman and director of engineering of the Coal Producers' Committee for Smoke Abatement. Under his direction, the committee has been active in over 200 cities in the United States. As a result of these activities, thousands of coal burning plants have been retained for coal. Mr. Lammers also worked for the Cincinnati Gas & Electric Co. as results engineer and, during World War II, was associated with the Wright Aeronautical Corp. as power supervisor and assistant plant engineer.

treme short supply of natural gas, 22½ yr. He also pointed out that the prospect of foreign gas threatened to disrupt the American fuel and railroad economy. He expressed hope that the FPC would examine more closely the adverse effects of present policies on fuels competing with natural gas and that Congress would amend the Natural Gas Act in the next session to restore equal competitive conditions among the several fuel industries.

### **Obituaries**

Micheleangelo DePietro, 64, division superintendent for Island Creek Coal Co., Holden, W. Va., died Aug. 3 at his home in Holden. He came to the United States from Italy at the age of 13 and

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Says W. W. Hise, Shop Superintendent, J. W. Moorman and Son



J. W. Moorman and Son maintains a uniform nventory of Aeroquip bulk hose and fittings right in the field.

Operating 50 pieces of heavy equipment on multiple shifts, J. W. Moorman and Son requires 10 maintenance men and 2 service trucks to keep units on the go. Quick replacement of all damaged fluid-carrying lines is assured because a supply of Aeroquip bulk hose and fittings is kept in the field service shop at all times.

Shop Superintendent W. W. Hise reports, "Nearly every day we make an original equipment hose replacement using Aeroquip. The bulk hose idea cuts downtime."

Any Aeroquip distributor listed in your Yellow Page Directory can show you how to cut costs with Aeroquip ... or write us direct.



Downtime due to hose line failure is held to a minimum. Here a parts man selects fittings prior to assembly.



Hose is cut to length and fittings are attached in a few minutes. With Aeroquip, only ordinary shop tools are needed.



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LOCAL REPRESENTATIVES IN PRINCIPAL CITIES IN U.S.A. AND ABROAD . AEROQUIP PRODUCTS ARE FULLY PROTECTED BY PATENTS IN U.S.A. AND ABROAD

began his career with Island Creek at an early age. Following engineering study at Marshall College, Mr. DePietro rejoined the company.

William C. Becker, 46, died Aug. 12 in Wilkes-Barre, Pa. He was a mine foreman at the Loomis Colliery, Glen Alden Corp., and had been associated with the company for 28 yr.

C. L. Griggs, 50, assistant superintendent, Wisconsin Steel Co., Benham, Ky., died July 24 of a heart condition in Knoxville, Tenn. He had been with Wisconsin Steel for 32 yr.

J. P. King, 50, mine operator, and owner of Law Ash Coal Co., Peytona, W. Va., died Aug. 1 from injuries he suffered in a slate fall at his coal mine.

### **Preparation Facilities**

DeKoven Coal Mining Co., DeKoven, Ky.—Contract closed with Roberts & Schaefer Co., Div. of Thompson & Starrett Co., Inc., for cleaning plant, including two Jeffrey 84-in 3-compartment 8-cell jigs for washing 3x0 raw coal at 1,000 tph.

Lillybrook Coal Co., Affinity mine, Affinity, W. Va.—Contract closed with Fuel Process Co. for Belknap 30-in. coal washer to handle 30 tph of reclaimed refuse.

Columbia Southern Coal Co., Midvale mine, Midvale, Ohio—Contract closed with Heyl & Patterson, Inc., for 36-in-diameter Reineveld dryer and accessories to handle 40 tph of ¼-in coal.

Stahlman Coal Co., Stahlman mine, Corsica, Pa.—Contract closed with Heyl & Patterson, Inc., for 36-in-diameter Reineveld dryer and accessories to handle 30 tph of %x0 coal.

Blue Bird Coal Co., Blue Bird No. 8 mine, Harrisburg, Ill.—Contract closed with Heyl & Patterson, Inc., for 60-tph Deister table plant, including six tables, Reineveld dryer, 14-in diameter cyclones, 5x14-ft dewatering screen and associated equipment.

Pond Creek Pocahontas Co., Mine No. 6 Beartown plant, Bradshaw, W. Va.—Shipment by the Deister Concentrator Co. of 12 SuperDuty Diagonal-Deck No. 7 coal-washing tables for cleaning 1/4x0.

### 1955 Coal-Company Earnings

Earnings reported below are for the first 6 mo of 1955, compared with the same period of 1954.

Ayrshire Collieries Corp. and subsidiaries—1955 net income of \$1,655,549, or \$2.77 a share, compared to net of \$1,350,644, or \$2.26 a share, for 1954 period

Pond Creek Pocahontas Co. and subsidiary—1955 net profit of \$769,890, or \$2.27 a share, compared to \$326,518, or 96c a share, for 1954 period.

Elk Horn Coal Corp.—1955 net income of \$397,958, compared to net loss of \$34,171 for 1954 period.

Westmoreland Coal Co.—1955 net profit of \$12,916, or 9c a share, compared to a loss of \$245,125 for 1954 period.

Glen Alden Corp.—1955 net earnings of \$1,695,000, or 95c a share, compared to net loss of \$169,000, or 9c a share for 1954 period. In his report to stockholders, Francis O. Case, president, said that the outlook for the third and fourth quarters of 1955 is good, both in coal and in sales of Mathes air conditioners, products of the Mathes Co., recently acquired by Glen Alden.

Island Creek Coal Co.—1955 net profit of \$1,512,582, or \$1.21 a share, compared to net profit of \$449,048, or 38c a share, for 1954 period.

### **Benedict Coal Changes Name**

The Benedict coal mines in the St. Charles, Va., coal field will start operating under a new name—Benvir Coal Corp. Managing personnel of the new corporation are Lester Redwine, president; Thomas Lyttle, superintendent; Dexter Taines, secretary-treasurer; Charles Newman, general manager; and E. K. Geisler. Mr. Lyttle said that the company will operate Mine No. 5 for 5 days each week and expects to reopen Mine No. 7 soon.

### H & P Names Kanawha

Heyl & Patterson, Inc., Pittsburgh, Pa., has appointed Kanawha Mfg. Co., Charleston, W. Va., as its sales and service representatives in West Virginia, the western counties of Virginia, and eastern Kentucky.

### **Ruberoid Promotes Three**

The Ruberoid Co., New York, has named John Lang general sales manager. Mr. Lang will be succeeded as assistant general sales manager by Joseph G. Hall, manager of the company's southwest sales district in Dallas, Tex.

### **OM Names Foster**

Appointment of William C. Foster as an executive vice president of Olin Mathieson Chemical Corp. has been announced by the firm's president, Thomas S. Nichols. Mr. Foster was formerly deputy secretary of defense and the first full time president of the Manufacturing Chemists' Association, Inc. During 11 yr of government service, he was also head of the Marshall Plan with cabinet rank and the title of Administrator for Economic Cooperation; Under Secretary of Commerce; Deputy United States Special Representative in Europe for ECA, with the rank of Ambassador Extraordinary and Plenipotentiary; and Deputy Administrator of ECA.

### Rome Cable Conduit Manager

Richard E. Gates has been appointed manager of conduit sales by Rome Cable Corp., Rome, N. Y. For the last several years he has been sales representative for the company in the Los Angeles area. In

### Among the Manufacturers

### Decker Made Sales Manager . .

Industrial Engineering & Construction Co., Inc., Fairmont, W. Va., has appointed Russell W. Decker as sales manager. Mr. Decker was employed by the Fairmont Machinery Co. from 1925 until 1953, serving the last 13 yr as sales manager. For the past 2 yr he was associated with Robinson & Robinson, consulting engineers, Charleston, W. Va., as manager of the coal preparation department. Mr. Decker will be located at the company's office in Fairmont.

### Lee-Norse Names Jack

E. M. Arentzen, president, Lee-Norse Co., Charleroi, Pa., has announced the appointment of Harry Jack as superintendent. Mr. Jack has been active in the electrical and mechanical fields of the coal industry for approximately 30 yr. Previous to his present position at Lee-Norse he was superintendent of maintenance for the Harmar Coal Co., Harmarville, Pa.

### Long Co. Elects Nelson

Robert C. Nelson has been elected vice president of The Long Co., Oak Hill, W. Va., J. B. Long, president of the company, has announced. Since attending Northwestern University, Mr. Nelson has had 18 yr experience in the field of coal mining equipment. For the past 3 yr he has been sales manager and director of sales promotion for The Long

Co. In his new position, he will continue to direct the firm's sales program and also act as assistant to the president.

### **General Electric Appoints**

General Electric Co. has appointed Bertram W. Mahoney, of Schenectady, N. Y., as general manager of its Industry Control Dept. He succeeds C. A. Salmonsen, who will be assigned to special projects in other departments of the company. Mr. Mahoney joined General Electric in 1922.

### Koehring Shifts Burton; Names Hill to New Post

The appointment of R. E. Burton as assistant general sales manager of the Koehring Co., Milwaukee, Wis., has been announced by Julien R. Steelman, president. Mr. Burton succeeds M. O. Messenger, who recently was named vice president and sales manager for Koehring's Canadian subsidiary, Koehring-Waterous, Ltd., Brantford, Ont. Mr. Burton has been associated with the Koehring organization since 1948. Also announced is the appointment of E. B. Hill to the newly created position of assistant to the president. Mr. Hill has had more than 30 yr experience in the construction equipment field. He was a sales executive for Gar Wood Industries, Ltd., before resigning to join the Koehring organization.

### THE WILMOT-OCC HM VESSEL (12 Ways) IS REALLY

NEW Simplicity of sink and float removal. NEW Visibility during operation. NEW Accessibility for

NEW Maximum in use of pool area.

maintenance.

NEW Quietness of pool.

NEW Ease of maintaining pool density.

NEW Ease of draining vessel.

NEW Low in number of wearing parts.

NEW Type of Drive.

NEW Type of Controls.

NEW Compactness.

NEW Low in installation costs.



In case you are presently considering the installation of heavy-media equipment, we earnestly invite you to send us samples of your feed for testing in the new Wilmot-OCC Vessel. At our White Haven, Pa., plant we operate a commercial size Heavy Media pilot plant for testing and demonstration purposes, also a well equipped laboratory. These latter facilities are modern and complete for sink-and-float and chemical tests.

To gain a full appreciation of what

the engineering advances of the new Wilmot-OCC Heavy Media Vessel may mean to you, we further suggest that you personally visit our pilot plant and see the Wilmot-OCC Vessel and HM system in actual operation. The importance of this new development in heavy-media preparation is, we believe, indicated by the increasing number of operators and engineers, from all fields, who are visiting our White Haven pilot plant. Models are manufactured for coal and ore preparation in sizes for 1/2 to 400 TPH.

WILMOT ENGINEERING CO.

### THE WILMOT-OCC HM VESSEL (12 Ways) IS REALLY

NEW Simplicity of sink and float removal.

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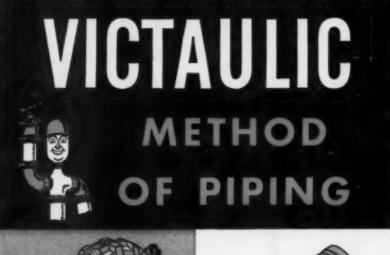
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Styles 77, 77-D for standard application. I. Simple, fast to install—sturdy and reliable. Sizes 44" to 30". Style 75 Light-Weight Couplings for light duty applications. Sizes 2", 3", 4". Additional styles for cost iron, plastic and other pipes. Sizes through 60".



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Handy, on-the-job grooving tools that do the work in half the time. Light weight, easy to handle—operate manually or from any power drive. Automatic groove position and depth. Sizes ¾" to 8".



Style 99 for plain or beveled end pipe. Best engineered, most useful plain end joint on the market. Simple, husky — easy and fast to install. Takes strong bull-dag grip on pipe. Sizes 2" to 8".



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central Kentucky; Charles A. Herron, Birmingham, Ala., Alabama, eastern Mississippi and western Florida; Victor H. Jones Co., Chicago, northwestern Indiana and northeastern Illinois; Ralph E. Little, Davenport, Iowa, northwestern Illinois and eastern Iowa; The Rhodes Equipment Co., St. Louis, Mo., eastern Missouri, southern Illinois, western Kentucky and southwestern Indiana; Southern Machinery & Supply Co., Roanoke, Va., Virginia; Stanley B. Troyer Equipment Co., Crosby, Miss., the states of Minnesota, North Dakota, South Dakota, northern Wisconsin and the upper peninsula of Michigan; United Equipment Co., Columbus, Ohio, central Ohio; and Western Ohio Ventilating Co., Toledo, Ohio, northwestern Ohio.

### **Clark Appoints Dealers**

Twelve new dealers have been appointed to sell and service the Michigan line of products of the Construction Machinery Div., Clark Equipment Co., according to an announcement by Clarence E. Killebrew, Clark vice president. Among the dealers and their territories are: R. C. Larkin Co., 3001 S. Wabash Ave., Chicago, parts of Illinois and Indiana; Highway Equipment & Supply Co., 5100 Paxton St., Harrisburg, Pa., 29 counties in Pennsylvania; Shelton-Witt Equipment Corp., 2231 Patterson Ave., Roanoke, Va., for parts of Virginia; and Reagan Equipment Co., 333 Second Ave. North, Birmingham, Ala., the state of Alabama.

### **Timken Expands Plant**

Plans for expenditure of \$850,000 for further expansion of productive facilities at the Bucyrus, Ohio, plant of the Timken Roller Bearing Co., has been announced by Russell P. Fowler, general manager of the plant. The entire Timken building and expansion program in Bucyrus is expected to be completed by the end of 1956.

### **Koppers Makes Sales Shifts**

Several organizational changes in the Sales Dept., Tar Products Div., Koppers Co., Inc., have been announced by J. C. Macon Jr., manager of the department. Walter L. Bossart, formerly assistant manager, refined coal tar products section, has been named manager of the section to succeed J. H. Carpenter, who is due to retire in less than a year. Mr. Carpenter, manager since 1929, will continue with the section as a consultant. Dr. J. N. Roche, manager of sales development prior to its consolidation in the new development department, has been appointed technical consultant to the creosote and pitch product section.

### Farris Engineering Expands

As part of a general expansion program covering both the company's manufacturing and sales facilities, Victor W. Farris, president, Farris Engineering Corp. and its affiliates, Palisades Park, N. J., has announced several new staff appointments and the establishment of a new plant in Houston, Tex. Promoted to manager of the new Farris Houston plant is Edward Groth Jr., formerly with

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the Farris Stacon Corp. Appointed as sales manager for the Farris Flexible Valve Corp. is Charles W. Hanlon. New area managers include Charles S. Lewis, covering the midwest sales offices with headquarters in Chicago; Albert F. Stumm for the mid-Atlantic states, with headquarters in Philadelphia; and Mr. Groth for the southwest, in addition to his other responsibilities in the Houston plant. Among future development plans is the establishment of another Farris plant in Canada.

### **Hewitt-Robins Buys New Plant**

Hewitt-Robins, Inc., Stamford, Conn., has announced plans to acquire the business, manufacturing facilities and assets of the W. A. Jones Foundry & Machine Co., Chicago, Ill., maker of heavy-duty speed reducers, pulleys, gears and other drive accessories. An agreement covering the terms of purchase has been signed by the two companies and the transfer was scheduled to take place Aug. 31. The new acquisition will be operated as the Jones Machinery Div. of Hewitt-Robins. Thomas A. Jones, president of the present company, will join Hewitt-Robins as manager of operations of the Chicago plant. All other operating and distribution personnel will also become associated with Hewitt-Robins.

### **U. S. Steel Appoints Two**

Griswold A. Price has been appointed assistant vice president, sales western area, for the United States Steel Corp. Mr. Price succeeds Herbert J. Watt, who has retired after 43 yr service as a sales executive with the U. S. Steel Corp. Kenneth Lieber has been appointed assistant vice president, sales, for U. S. Steel's National Tube Div. Mr. Lieber joined Consolidated Western Steel, now a division of U. S. Steel, as a contracting engineer in 1945 and has been vice president in charge of engineering for that division since January.

### For Your Information

Firth Sterling, Inc., has appointed the McComb Supply Co., Harlan, Ky., as a distributor. The McComb Supply Co. will stock a complete line of Firthite "Blue Bit" mining tools.

The appointment of James H. Joyner as manager, Pacific Coast Sales, Quaker Pioneer Rubber Mills, Div., H. K. Porter Co., San Francisco, Calif., has been announced by G. A. Dauphinais, vice president and general manager. Mr. Joyner has been manager, Los Angeles branch.

William E. Dickinson, highway and concrete engineer, has been named chief engineer, Calcium Chloride Institute, according to an announcement by G. H. Kimber, president. His new duties as chief engineer will include direct responsibility for engineering, research, and technical activities.

T. G. Shughrou has been appointed sales representative in southern West Virginia for Consolidated Rubber Corp., Pittsburgh, Pa. Consolidated Rubber distributes Hamilton Rubber Mfg. Corp.'s, industrial rubber products.

# Maumee Endorses Spencer Product For Akremite Process



Bank-shooter charging drillhole with Akremite, Maumee Mine No. 20.

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The principal material in the manufacture of Akremite is ammonium nitrate. Spencer Chemical Company, one of the world's largest producers, has developed a Commercial Grade Ammonium Nitrate especially for the Akremite Blasting Process. Spencer is prepared to supply your needs.

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Kansas City, Missouri



### Coal Future to Keynote Solid Fuels Conference

The technical program has been announced for the 1955 AIME-ASME Joint Solid Fuels Conference to be held at the Neil House, Columbus, Ohio, Oct. 19-21. Keynote of the national conference will be the future of solid fuels, which has brightened with the remarkable rise of cond production this year after 7 yr of

declining markets.

The program includes the following papers: "Coal Reserves of the U. S. for Future Use," Clayton G. Ball, president, Paul Weir Co., Chicago, Ill.; "Opportunities for the Fuel Technologist in the Coal Industry," T. S. Spicer, professor, fuel technology, Pennsylvania State University, University Park, Pa.; "Future Trends in Stoker Design," Earle C. Miller, research engineer, Riley Stoker Corp., Worcester, Mass.; "Trends in Coal Handling for Electric Power Stations," illustrated with the motion picture "From Mine to Plant," Howard E. Nelson, manager, conveyor engineering, The Jeffrey Mfg. Co., Columbus, Ohio; "Trend of Future Coal Washers," J. A. Glunt, steel works metallurgist, and J. R. Dawson, chief chemist, Jones & Laughlin Steel Corp.; "Lignite as a Future Fuel for Steam Generation," R. L. Sutherland, research consultant, Truax-Traer Coal Co., Chicago, Ill.; "Future of Synthetic Liquid and Gaseous Fuels," H. R. Batchelder, consulting chemical engineer, and Harlan W. Nelson, chief, Fuels Tech-nology Div., Battelle Memorial Institute, Columbus, Ohio; and "Effect of Fly Ash Utilization on the Future of Solid Fuels," H. H. Russell, project engineer, Bituminous Coal Research, Inc., Pittsburgh.

In addition to the technical program, conference participants will hear addresses by the following well-known figures in solid-fuels circles: David R. Mitchell, secretary-treasurer, AIME Coal Div.; Carroll F. Hardy, chairman, ASME Fuels Div.; L. C. Campbell, president, National Coal Association; and Ralph A. Sherman, technical director, Battelle

Memorial Institute.

A highlight of the conference will be the presentation of the Percy Nicholls Award for 1955. This honor is conferred annually upon an individual who has made outstanding contributions to the science or technology of solid fuels.

### Olin-Mathieson Plans Gas-from-Coal Unit

Olin-Mathieson Chemical Corp. has announced that it will install an experimental unit at its Morgantown, W. Va., plant to produce synthetic gas directly from coal, which will eliminate the coking process presently used. Thomas S. Nichols, president, said that installation of the experimental unit will require 8 mo during which present operations will continue. If the experiment succeeds, the entire plant will be converted to the new process. Mr. Nichols added that the U. S. Army has approved this commercial-size experiment as the first step in the modernization of the Morgantown plant.



A mine locomotive presents a pretty sorry picture to maintenance engineers when it's "dead in its tracks." No wind, no stamina, no punch—a locomotive is really out of trim without its regular diet of electricity.

That's why smart maintenance men equip their mine locomotives with Hazacord reel cables—they really keep mine equipment on the move.

Hazacord Locomotive Reel Cables are distinguished by Hazard's new Hex-Tite design. Hexagonal insulation, tough, heat- and moisture-resisting, provides six plane surfaces to lock with the Hazaprene ZBF sheath, preventing internal slipping and rotation. Heavy reinforcing cords embedded in both insulation

### MAZARRARE ZBE SHEATH

and sheath form an additional guard against pulling, and a special adhesive completes the bonded construction.

Hazacord's "locked-tight" cable design is your best assurance of steady trouble-free locomotive operation.

"Compensated stranding" of conductors gives a high degree of non-fatiguing flexibility and prevents dangerous bird-caging. The Hazaprene ZBF sheath, cured under pressure in a continuous metal mold, is extremely rugged and resistant to the deteriorating effects of oil, acids, alkalies and mine water. Service records show the unusual ability of Hazaprene-sheathed Hazacord cables to withstand constant tension, rough handling, twisting and abrasion as well as heavy impact.

Write for Hazard's new Mining Cable Catalog, Bulletin H-450, for information on Hazacords for mine locomotives and other mining machinery. Hazard Insulated Wire Works, Division of The Okonite Company, Passaic, N. J.





### CHECK WITH YOUR BOLTING CREW

Many time studies and tests made by roof bolting crews on expansion shell load-strength and bolt handling and installation time show that the new PATTIN double expansion shell assembled with bolts with the new self-centering head cut usual handling and installation time up to 30 per cent while providing the strongest known anchorage for the bolts. Have your bolting crews test the PATTIN shells and bolts. Write or phone us—we'll gladly work with you on any bolting tests.





### COAL MEN ON THE JOB . . .

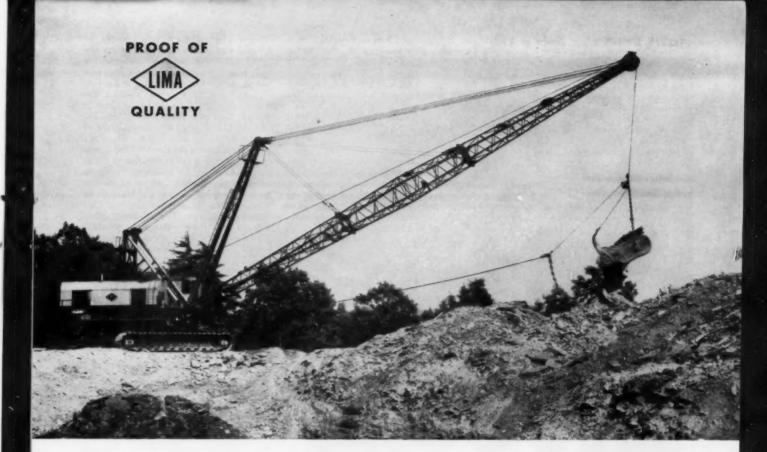
VALLEY CAMP COAL CO.—Valley Camp No. 8 mine, Shrewsbury, Kanawha County, W. Va.—Seated: Estle Elswick (left), Herman Hudnall and Edward Keenan. section foremen, day sh'ft. Standing: C. M. Brown (left), personnel director for the Southern Div. of the company, Joseph Marshall, safety engineer, Southern Div.; and Meade Davis, chief electrician, Valley No. 8



VALLEY CAMP COAL CO., Valley Camp No. 8 mine, Shrewsbury, Kanawha County, W. Va.—Second shift, all section foremen except as noted: Paul Sparkman (seated, left); P. E. Burgess; and Louis C. Scolish, night foreman; Ralph Kincaid (standing, left) and John D. Phillips.



POCAHONTAS FUEL CO., INC., Pocahontas, Va.—In the analytical laboratory, Robert S. Lane (foreground), mechanical engineer in charge of analytical and research laboratories. Background: M. H. Hurley (left), assistant chemist; John R. Soos, laboratory technician; and W. O. McKinney, chemist.



BAILEY COAL COMPANY REPORTS ...

### "Our two rugged Lima Type 2400 draglines strip overburden fast!"

Two big, rugged, fast-working Lima Type 2400 draglines pay real dividends in stripping operations for the Bailey Coal Company, Morrisdale, Pennsylvania. Lane Wrye, Job Foreman at Bailey's Gorton strip tells how:

"Our two Lima Type 2400s strip overburden fast! Their big capacity and high-speed operation get us down to the coal level in a hurry . . . whether we have to go through rock, shale or dirt. And these tough, stable machines travel and work anywhere, no matter how rough the footing.

"Our Limas can take the grind of round-the-clock operation, too. We worked our first 2400 through three shifts a day for over four years and the second machine for two years. In that kind of operation the full air controls on the machines are another big help. They let an operator work a full eight-hour shift at top speed and top efficiency."

Mr. Wrye concludes: "We've had excellent performance from our Limas. They've given us high speed stripping for more profitable operation every place we've used them."

Why not take a tip from the experience of Bailey Coal Co.? Equipped as a dragline or shovel, the six yard Lima Type 2400 can speed your stripping operations for greater profit. Like every machine in the Lima line, it's designed and built with the emphasis on quality to give you top performance on every job . . . without costly downtime. It will pay you to get complete details on the Type 2400—or other Limas with capacities best suited to your job requirements. Call your nearby Lima distributor today, or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.



One of Bailey Coal Co.'s Type 2400 s, equipped with 110 foot boom, is shown removing shale at Gorton. The extra-wide, extralong crawlers give the Type 2400 maximum stability.



BALDWIN - LIMA - HAMILTON

Construction Equipment Division . LIMA . OHIO . U. S. A.

### NEWS BRIEFS . . . From p 112

to the board from an order issued pursuant to Section 230d or 206c. Moreover, the other individual criteria for the issuance of a gassy classification order under Section 203d are each stated in the singular, namely, a finding 'that methane has been ignited in such mine,' and a finding of 'methane by use of a permissible flame safety lamp.'"

### Coal Takes Court Action Against Gas Expansion

The coal industry has initiated court action to stop the continued raiding of coal's boiler fuel markets by natural

gas, as sanctioned by the Federal Power Involved is the FPC's Commission. authorization to Southern Natural Gas Co. to deliver up to 60 million cu ft of gas per day for use as boiler fuel in that company's Urquhart generating station at Augusta, N. C. A joint petition to review the commission's order has been filed with the U.S. Court of Appeals for the District of Columbia, along with a motion to stay the commission's order. Argument was scheduled for Aug. 16. Petitioners on behalf of the coal industry include Fuels Research Council, Inc.; the National Coal Association; the UMWA; and the Atlantic Coast Line, Charleston & Western Carolina, Louisville & Nashville, and Clinchfield railroads. Two

other similar cases are being fought by the coal and railroad interests before the One concerns FPC authorization for the use of natural gas from Northern Natural in the municipal plant at Grundy Center, Iowa. The other, awaiting the examiner's decision, involves the application of Northern Natural to dump gas into the Black Dog Lake power plant of Northern States Power Co., St. Paul, Minn. In another case, the FPC has issued an order denying the application of Cities Service Gas Co. for authority to supply natural gas as boiler fuel in an electric generating plant being constructed by Missouri Public Service Co. in Cass County, Missouri. The National Coal Association, Fuels Research Council, Inc., and the UMWA opposed the application. The denial avoids the displacement of about 73,000 tons of coal in 1956 and 118,500 in 1957 and in subsequent years.

### **Pending in Congress**

With the adjournment of Congress Aug. 2, unfinished business of interest to the coal industry included the following:

Natural gas—The House-approved Harris bill to exempt natural gas producers from direct federal regulation is pending in the Senate, where the Senate Commerce Committee has approved the similar Fulbright bill.

Transportation tax—The House Ways and Means Committee failed to complete work on the "bobtail" tax bill. This bill contains the important Baker amendment to repeal the tax of 4c per ton on the transportation of coal. Another provision permits accelerated amortization of facilities to prevent water pollution. During the recess period a subcommittee will study excise tax problems.

Social Security—A House-passed bill to widen benefits and increas costs remains in committee in the Senate.

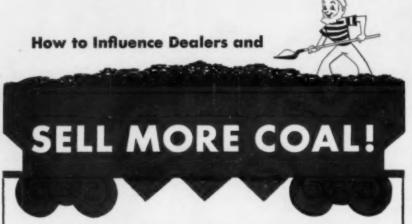
Water pollution—The Senate failed to complete action on S. 890 because House amendments were unacceptable. The bill provides for federal and state cooperation in controlling water pollution.

Public lands—Both houses passed, and sent to the President, H. R. 100 which permits mining, development and utilization of mineral resources of public lands withdrawn or reserved for power de-

Coal lands—Both houses passed, and sent to the President, H. R. 6994 which provides for entry and location on public lands classified or known to be valuable for coal, when discovery of a valuable source material is made on these lands.

Fair Labor Standards Act—Bills have been introduced to eliminate the exemption of large retail establishments whose activities affect interstate commerce. This subject is expected to receive consideration next year.

Walsh-Healey Public Contracts Act— Various bills were introduced during the past session to repeal the Fulbright Amendment (granting full rights to appeal determinations by the Labor Secretary), and to spell out the Secretary's authority to make industry-wide or area-



# Salted Coal Prevents Frozen Cars... Saves Unloading Dollars and Delays ...Builds Customer Goodwill



Order Sterling Auger-Action Rock Salt New! in carloads, bulk or handy 100-lb. bags. More and more operators are using STERLING ROCK SALT to treat their winter shipments. Why? Because it's good business . . . with tangible and traceable results in customer goodwill and the extra sales that goodwill always produces.

And, for equally businesslike reasons, these operators insist on STERLING ROCK SALT. It's economical. Handles easily. Stores without loss. Dissolves slowly, therefore effective longer. And it's harmless to worker's clothes.

### Saves Money and Delays at the Mine, Too.

A few cents' worth of STERLING ROCK SALT prevents frozen scales and track switches... keeps roads and tracks open and safe. Removes ice and snow from platforms... and keeps essential work areas clear.

STERLING AUGER-ACTION ROCK SALT INTERNATIONAL SALT COMPANY, INC., SCRANTON, PA.





Diagram showing magnetic field for 2-coil, 36-in.-dia., 42-in.-wide pulley. Note how magnetic field blankets entire load.

### New magnetic pulley stops tramp iron riding the load peaks

This new Stearns 2-coil electro-magnetic pulley effectively removes tramp iron riding the crest of a conveyor load as well as the pieces that pass close to the magnet's face. Two-coil design produces a powerful magnetic field that is deepest at the center of the conveyor belt where load is heaviest. Thus, the area of magnetic attraction is the same general shape as the load on a conveyor operating under standard conveyor practices.

### Smaller, lower-cost pulleys now practical

Because of the nature of the magnetic field, smaller pulleys costing less can now be used on jobs where larger units were formerly needed. An examination of data on a number of proposed installations showed that, in the majority of cases, the recommended new 2-coil pulley was of smaller diameter than a 3-coil pulley of comparable ability.

### New, simple pulley selection method\*

Because this pulley fits right into recommended conveyor standards for speed of belt travel and depth of load for various types of materials, it is far simpler to select the right pulley than ever before. Stearns provides new selection tables in Bulletin 303-C that now make it possible for you to select the right size unit for your job even before you consult our sales engineers.

Get all the facts on this new magnetic pulley. Find out how it simplifies pulley selection. Write for Bulletin 303-C.

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### Giving Coal The Shakes . . .



Now you can screen coal easier, faster and with less time out

due to blinding. Here's the secret: Use Hendrick Perforated Plate on your vibrating and shaking screens. For Hendrick can often mean the difference between profit and loss in coal preparation. Hendrick Perforated Metal Plate stands up under continuous heavy-duty usage . . . screens last longer and openings remain uniform to assure accurate sizing. For information on the flat, corrugated or stepped shape and the size of perforation that is best suited to your particular needs, write to Hendrick today.



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wide minimum wage determinations. These proposals await consideration next year.

TVA steam plants—Awaiting action by the Senate is S. Res. 146, which would prevent expenditure of funds by TVA for construction of steam plants until approved by Congress.

### ICC Sustains Increases On Lake Coal

The ICC has declined to suspend increased rates on fine coal moving to Lower Lake ports and other increases in the all-rail rates on fine and lump coal which were included in a package deal to take effect Aug. 1. At the same time, the ICC did suspend all of the changes proposed by the railroads in the refund provisions on coal moving ex-dock in the northwest by varying modes of transportation. This means that the refunds will now apply, as they have during the past year, to all coal moving ex-Lake docks regardless of how such coal is transported. Concern was expressed over the ICC decision to sustain Lake-coal rate increases because this allows the railroads to increase freight rates on about 50 or 60 million tons of coal when coal production is below the declared safety floor of 500 million tons annually. High rail freight rates are said to be one of the principal obstacles to increased production of bituminous coal.

### Three Coal Men Named to Natural Resources Group

Three coal industry representatives are among 41 outstanding business and civic leaders who have been appointed members of the Natural Resources Committee of the Chamber of Commerce of the United States for 1955-56. They are George C. Enos Jr., executive vice president, The Enos Coal Mining Co.; David L. Francis, president, Princess Elkhorn Coal Co.; and George A. Lamb, manager, business surveys, Pittsburgh Consolidation Coal Co. The committee helps to keep the chamber informed on developments and trends affecting natural resources and makes recommendations on policy matters.

### Koppers to Build Coke Ovens for U. S. Steel

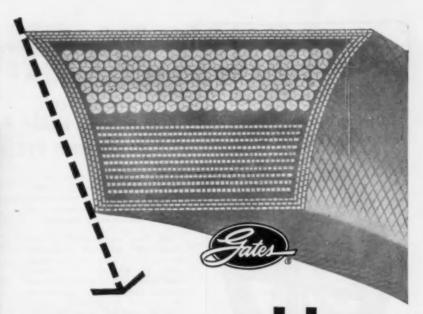
A contract to build a battery of 59 chemical-recovery coke ovens and auxiliary equipment at the Lorain, Ohio, works of the National Tube Div., U. S. Steel Corp., has been awarded Koppers Co., Inc., it was announced Aug. 17. This is the eighth contract to be awarded Koppers by National Tube to build batteries at the Lorain site. When the new gun-flue-type coke-oven battery is completed it will increase the coal carbonizing capacity of the Lorain works about 1,088 tpd.

### Lorado Scholarship Awarded

Stanley B. Johnson Jr., president, The Lorado Coal Mining Co., Lorado, W. Va., announced Aug. 15 the award of a company scholarship at West Virginia University to Lowell Adkins. He graduated this year from Man High School with an

Shock and vibration are absorbed by this Gates Vulco Rope Drive on the ball mill in a New York rock crushing plant, saving over \$600 a year in maintenance costs. Management gives credit to the resiliency of the Gates Vulco Ropes and to their concave sides for the many years of dependable service they have given.





# concave sides lengthen V-belt life ... cut costs

Fig. 1 Hundreds of plants that keep track of V-belt drive costs know this: Gates Vulco Ropes . . . the V-belts with concave sides...wear much longer and cost less per year of service.

Here is the interesting reason why:



When a Gates V-belt bends around the sheave, the *precisely-engineered* concave sides (Fig. 1) fill out and become straight. Thus

the sides of the belt make full, uniform contact with the pulley (Fig 1-A).

Naturally, uniform contact distributes the wear evenly. And even wear means longer wear.

Longer wear saves not only on replacement

costs; it also saves the cost of down-time.... keeps equipment producing.



Simple test proves value of concave sides



Take a straight-sided V-belt (Fig. 2) and bend it. Feel the sidewalls of the belt bulge out as the belt bends. You see im-

mediately that the bulging sides prevent uniform contact with the pulley (Fig. 2-A). Uneven contact causes faster wear...increases your drive replacement costs.

Let the cost-saving longer life of Gates Vulco Ropes contribute to *your* profits. Specify Gates Vulco Ropes—the V-belts with concave sides (U.S. Patent 1813698). The Gates Rubber Co., Denver, Colorado—World's Largest Maker of V-belts.

Gates Engineering Offices and Distributor Stocks are located in all industrial centers of the United States and Canada, and in 70 other countries throughout the world.

TFA - 548





DRIVES

# GUYAN "Venta-Mine" FANS



## The Ideal FAN for economical low pressure mine ventilation.

Guyan Venta-Mine Fans are of sturdy, simple construction with a channel ring housing and electric welded angle cross members and vertical center angle supports.

These Fans are available in four sizes—36", 48", 60" and 72". Blades on all sizes are cast aluminum. The 60" and 72" diameter fans have hubs of high grade cast iron so arranged that blades may be pitched at different angles. The 36" and 48" diameter blades are cast solid and therefore are not adjustable. The shaft extends each side of fan so that driver may be installed on either side.

For complete construction details write for GUYAN catalog.

GUYAN MACHINERY CO.

LOGAN, WEST VA.



You can always depend on Flood City Centrifugal Pumps . . . all sizes, up to and including 8" discharge and up to 1500 gallons per minute capacity. Pump bodies and operating units can be furnished in either acid-resisting bronze or stainless steel.

#### PUMP REPLACEMENT PARTS

Flood City has, for many years, enjoyed an enviable reputation as a manufacturer of replacement parts for

both centrifugal and plunger pumps. We are prepared to furnish replacement parts for the products of practically all pump manufacturers.

Impellers and other parts for centrifugal pumps can be furnished for any type, in either stainless steel or acid resisting bronze. We would be pleased to have our engineer visit your mine and sketch any parts you may desire a quotation on . . . at no obligation to you!

FLOOD CITY BRASS & ELECTRIC CO.

JOHNSTOWN, PA. Soles Agent Konswho Reil & Machinery Co. CHARLESTON, W. VA. outstanding record in scholastic and extracurricular activities and is the son of Mr. and Mrs. Luther Adkins, long-time residents of Lorado. Luther Adkins is a supervisor and has been associated with the Lorado company for 20 yr. The scholarship recipient will enter West Virginia University this fall in the coal mining engineering course.

#### P&R Shareholders Vote To Diversify Business

Stockholders of Philadelphia & Reading Coal & Iron Co. voted overwhelmingty Aug. 15 for changes in the company's charter that would permit it to operate in industries other than coal and iron. The action followed an announcement last May that Philadelphia & Reading had been exploring the possibilities of diversifying its business to provide more earnings and greater financial stability. The shareholders also approved a proposal which allows the company to change its corporate name to Philadelphia & Reading Corp., and authorized indebtedness up to \$15,000,000.

#### P&C First Aiders Score Again

A first-aid team from Bergoo No. 4 mine. Pardee & Curtin Lumber Co., tallied a perfect score to place first in the Fifth Annual Mid-State Coal Mining Institute at Camp Caesar, W. Va., Aug. 13. National champions in 1953, the team won a number of prizes for its latest victory. Second place went to a team from Peters Creek Coal Co.'s Cornelia mines. Third was won by a team from Pardee & Curtin's Bolair mine.

#### Illinois Survey Group Celebrates 50 Yr

The Illinois Geological Survey will celebrate its 50th anniversary Oct. 11 at Urbana-Champaign, Ill. Friends and alumni, state industrial leaders, and delegates of universities and colleges will join in the celebration which marks the survey's 50 yr of research, publication and public service on coal and other mineral resources of Illinois. Thurlow G. Essington, chief counsel of the Illinois Coal Operators' Association, Chicago, will preside at the forenoon session. Morris M. Leighton, chief emeritus of the survey, will address the gathering on "The Survey's Response to the Economic Pattern of the Past Fifty Years." J. R. Van Pelt, president, Montana School of Mines. and director of the Montana Bureau of Mines and Geology, will be the principal speaker at the mineral industries luncheon to be held in the Illini Union. afternoon symposium will feature a talk on "The Relation of Coal Research to the Economy of the State," by B. R. Gebhart, vice president, Freeman Coal Mining Corp., Chicago. Advance reservations for the jubilee banquet may be made by addressing George M. Wilson, Rm. 100, Natural Resources Bldg., Urbana, Ill. Copies of the program and a historical review may also be obtained. On Oct. 12 there will be a tour of the survey's laboratories and the survey will be host to the American Association of Geologists.

## MILLIONS OF YARDS

## 2 MANITOWOC 4500's strip 3½ million yards of overburden per year for Hart and Hart, Providence, Ky.

It takes plenty of mechanical muscle to move millions of yards of tough overburden — 95% of which was rugged rock and shale!

These two big Manitowors—a 4500 high-lift 5½ yd. shovel and a 4500 Dragline with 100′ boom—powered their way through 80′ of this rough going 24 hours a day, six days a week, all year long. Between them, these big workers uncovered over 478,000 tons of coal!

In addition to tremendous power, Manitowocs have the fast travelling speeds, the maneuverability, the operating speeds, and the stamina it takes to turn out big production on even the toughest jobs. These outstanding features—plus a minimum of down-time—mean profitable operation on every job! Get all the facts on Manitowoc. Manitowoc Engineering Corp., Manitowoc, Wis.





#### Mine Welfare Fund Reaches New Peak Despite Drop in Royalties

Trustees of the UMWA Welfare and Retirement Fund reported Aug. 18 an increase of more than \$10 million in the fund's unexpended balance, from \$93,-565,045, as of June 30, 1954, to a new peak of \$103,607,911, as of June 30, 1955. The previous high point was \$99,-505,000 on June 30, 1952. Other sources attributed the gain to reduced benefits to miners and their families and said it was made despite a decline of almost \$4,-500,000 in coal production royalties paid into the fund during the 1954-55 fiscal year.

Total revenues for the year ending June 30, 1955, as shown by the UMWA annual report, were \$129.227,658. Expenditures totalled \$119,184,792, of which 97%, or \$115,609,632, were payments aiding 210,599 fund beneficiaries. All administrative costs of the fund, including those of its Washington headquarters and its 10 area medical offices, were 3% of total fund expenditures.

Of the total benefit expenditures for the fiscal year, pension payments were \$69,896,155. As of June 30, 1955, some 59,482 retired miners were receiving these fund pensions of \$100 a month.

Funeral expense and widows' and survivors' benefits of \$2,879,176 aided 8,403 widows and orphans of deceased miners. Additional payments of \$60,643 in mine disaster benefits aided families of 240 miners killed or seriously injured in mine disasters during the year.

Hospital and medical care benefits of

\$42,773,658 provided 95,824 fund beneficiaries with 1,605,486 days of hospitalization. Medical and surgical services for these hospitalized cases required 1,531,-634 visits by physicians. Services of specialists through 1,024.174 office and outpatient clinic consultations were also provided.

Supplementing the fiscal year data, the annual report also reviews the fund's extensive operations for the 9-yr period of its existence. Benefit payments during this period totalled more than % of a billion dollars, and aided about 1,000,000 beneficiaries,-miners, their families, their widows and orphans,-at an administrative cost slightly below 3%, said to be lowest administrative cost ever achieved by a fund of this nature.

#### Pa. Safety Group **Holds First Aid Meet**

The Central Pennsylvania Safety Association held its first-aid meet at Spangler, Pa., Aug. 6. The Cardiff mine, Imperial Coal Corp., captained by L. D. Kimmel, won first place with a score of 99.9331 and was awarded \$350 and the MSA plaque. With a score of 99.933, second place awards of \$175 and the National Coal Association trophy, went to No. 72 mine, Bethlehem Mines Corp., captained by Walter Vedock. The Sonman mine, Eastern Gas & Fuel Associates, captained by Frank Frytak, won third place with a score of 99.8 and was awarded \$140 and the UMWA trophy.

#### **Pocahontas Fuel Starts Local Air Service to Mines**

The Pocahontas Fuel Co. plans to put into operation a two-seat, single-engine plane for regular flights between its main offices at Pocahontas, W. Va., and mines at Bishop and Itmann, W. Va. Purpose of the flights, two to each mine daily, is to carry records, machinery parts and coal samples which in the past have been transported over the mountains by car. The landing strips are being built on slag piles under supervision of the company's engineering department. Each strip will be about 500 ft. long. This is believed to be the first time that a small plane has been used in the area to make flights directly to a mine site. Company officials expect that the new service will result in substantial savings.

#### Coal Companies Share in Tribute to Bridge Builder

Plans are under way for memorial rites at the Wheeling (W. Va.) suspension bridge to recognize the contributions of John A. Roebling to bridge engineering in the United States. Mr. Roebling, who





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... so much better, in fact, that C-M-I Dryers are piling up new records for economy and efficiency in preliminary dewatering operations.

... so much better that C-M-I Dryers are not only replacing costly heat drying in preliminary dewatering but, in many cases, are eliminating entirely the need for heat drying.

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is being reclaimed from slurry by C-M-I
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so low as to make this operation extremely
profitable. Yes—slurry reclamation CAN be
profitable—when done the C-M-I way. Find
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backhoe buckets dippers and parts repointers dragline buckets and parts dragline chain sheaves pinions crawler shoes

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To get maximum life out of your equipment, specify Amsco manganese steel parts from the manufacturer.

Amsco also produces other alloy steels with maximum wear resistance under particular conditions of service.



AMERICAN MANGANESE STEEL DIVISION
Chicago Heights, III.



#### Looking for millionths of an inch to keep your Crane Valves tighter longer

How big is a micro-inch?

At Crane it's mighty big . . . because it is one of the noticeable differences between Crane Quality Valves and the run-of-the-bin kind.

Measuring seating surface smoothness in micro-inches is the job of the Crane technician in the picture. His findings are important to keeping Crane production at the high-quality level.

Crane carefully measures seating surface smoothness to make sure that the Crane Valves you install will operate smoothly without seizure, seat tightly and wear longer, thus helping reduce your maintenance and repair costs to the minimum.

Such care in manufacture for more than 100 years is just one reason why thrifty buyers prefer Crane Valves... why industry keeps on using more Crane Valves than any other make... why you should always buy Crane.

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Bigger Selection
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for Every Need





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immediate power cut-off protects conveyor belts . . .

Ensign Centrifugal Switches with time delay relay, protect belts against fire due to slippage, reduces belt replacements, shut-downs, tonnage loss. Easily added to existing systems. Provides sequence operation in multiple belt or chain units. Operates forward or reverse. Dust-tight or explosion-tested enclosures.

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Rugged construction—extra strength and long service life are only part of the Page RH Class Bucket story. The payoff is the automatic digging action and greater carry-out capacity that's built into the heavy duty RH. That's why production-conscious owners standardize on Page Automatic Dragline Buckets.

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redesigned and built the present structure of the century-old span across the Ohio River, also constructed the Brooklyn Bridge. The initial meeting to formulate plans for the occasion was attended by prominent West Virginia and Ohio engineers and included Otis Bledsoe, Thomas A. Grove, Thomas Henderson and Forest Thaxton, Hanna Coal Co.; M. D. Ayres, R. S. Carnahan, A. C. Flanders and R. A. Mudge, Wheeling Steel Corp.; and William K. Hanna and Albert Neroni, John A. Roebling's Sons Corp. memorial will be in the form of a large bronze tablet suitably inscribed and provided by Roebling.

#### Va. Ups Compensation Rate

Virginia's State Corporation Commission July 27 granted a request of three insurance companies to increase rates for workmen's compensation insurance for coal mines. The commission, however, failed to grant the full request of the companies and ordered a study made of the rate making plan which has been in effect in Virginia. The three firms had requested a rate of \$4.69 per \$100 for large mines and a rate of \$7.91 for small mines. The proposed rates included an increase for occupational diseases of 10c, which was denied.

#### **New Books for Coal Men**

#### **Design for Permissibility**

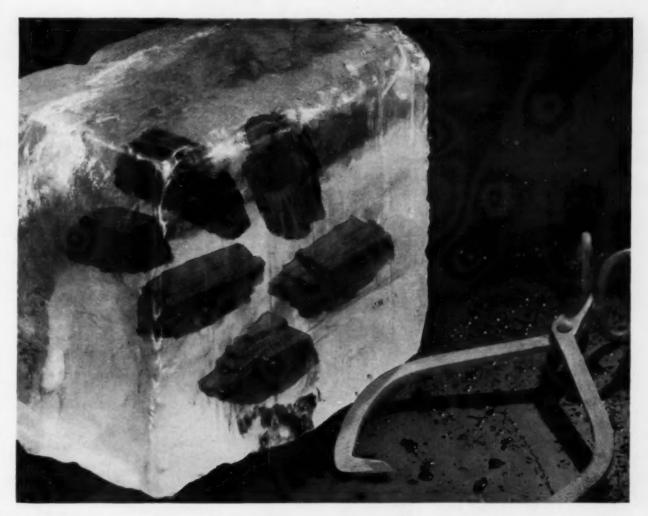
Explosion-Proof Design and Wiring for Permissible Mining Equipment, by E. J. Gleim, R. S. James and H. B. Brunot. A discussion of design features of explosionproof units that have been used in the construction of permissible machines. The bulletin also is a revision of Bulletin 258 and includes the numerous developments since that bulletin was written. USBM, Bulletin 541. 40 pp. 7% x 10%; paper 50¢, Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

#### **Anthracite Flood Prevention**

Flood Prevention in Anthracite Mines, Western Middle and Southern Fields, by S. H. Ash, H. A. Dierks, H. D. Kynor, W. H. Lesser, P. S Miller and W. M. Romischer. This report is the second in a series outlining the mine-water problems and the need for flood-relief measures in the anthracite region. The water problem is analyzed from the engineering and economic viewpoints and recommendations are made to solve the problem. USBM, Bulletin 546, 37 pp. 7% x 10%; paper. \$1.75, Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

Flood Prevention in Anthracite Mines, Northern Field, by S. H. Ash, H. A. Dierks, H. D. Kynor, W. H. Lesser, P. S. Miller and W. M. Romischer. The third in a series on anthracite mine-water problems and how they can be solved. USBM, Bulletin 547, 35 pp. 7% x 10%; paper. \$1, Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

More "Books" on p 144



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#### **Illinois Coal Resources**

Subsurface Geology and Coal Resources of the Pennsylvania System in Wabash County, Illinois, by G. H. Cady, M. B. Rolley, Adabell Karstrom, M. A. Parker and M. E. Hopkins. This bulletin includes the latest information and maps on geology and coal resources in Wabash County, Illinois, along with structure contour maps for the Nos. 6 and 7 coal beds. Illinois State Geological Survey, Report of Investigations 183. 24 pp plus maps. 6% x 9%-in; paper. No price quoted. State Geological Survey, Urbana, Ill.

Subsurface Geology and Coal Resources of the Pennsylvania System in Jasper County, Illinois, by F. E. Williams and M. B. Rolley includes a discussion of four limestones and six coal beds with special reference to their use as key structural marker beds. Illinois State Geological Survey, Report of Investigations 181. 14 pp plus maps. 6% x 9%-in; paper. No price quoted. State Geological Survey, Urbana, Ill.

#### Other Books and Booklets

Developments in the Sampling of Air-Borne Dust, by Theodore Hatch. An up-to-date discussion of the recent developments in the relationships between dust exposure and hazard, and criteria available against which to evaluate analytical procedures. 6 pp. 6% x 10¼-in; paper. Free, Industrial Hygiene Foundation, Mellon Institute, 4400 Fifth Ave., Pittsburgh 13, Pa.



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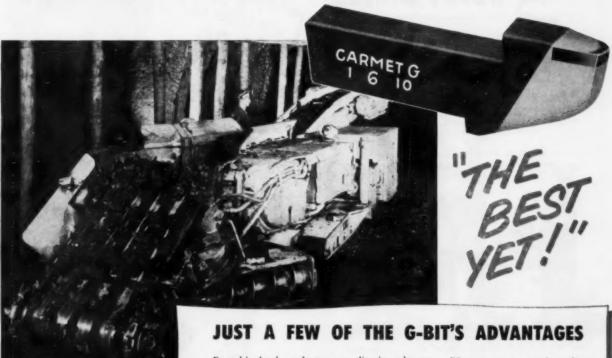
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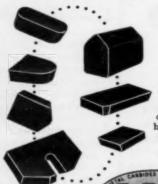


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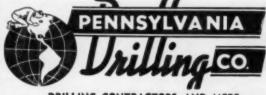
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September, 1955 · COAL AGE

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Belt Width	Length of Conveyor	List Price	Sale Price
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18"	45'	1839	1005
18"	60'	2384	1254
18"	100'	3764	1912
20"	25'	1265	713
20"	45'	1965	1060
20"	60'	2490	1320
24"	25'	1322	773
24"	45"	2062	1145
24"	60'	2617	1434
24"	100'	4097	2166
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30"	65'	3101	1718
30"	85'	3731	2144

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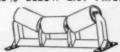
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T-TOIL	O Character	crex 1	Section 1	LAMINE	101
14"	Belt\$	6.38		Belt\$	
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-58C Jey Shuttle Cars, Medern
-32E-7 Jay Shuttle Cars,
-32E-7 Jay Shuttle Cars,
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-Lato Type Lee Norse Shuttle Cars, elevating dis-tharges

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29-42" t.g. end dump. 22" high
i—6 ten Vuican Diesel Locometive—Rehuit
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2-2 ton Boom Hoists, AC
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1—30 h.p. slangle drum holst

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3—AZ Jeffrey Drill

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10—24J and 38J, 230 volt DC Motors—New Armature—35B, 12AA, 803, 823, CE7, 212AA &

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1—7B Sullivan super shertwall
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2-2½-3½ tan Mancha, 24° ga.
1-4 tan Westingheuse, 24° ga.
1-4 ton ironten, 36° ga.
2-5 tan General Electric, 36° ga.
3-6 tan ironten, 36° ga.
3-8 tan ironten, 36° ga.
3-8 tan Geodman, 36° ga.
4-10 tan Atlas, 36° ga.
4-10 tan Atlas, 36° ga.

#### TROLLEY LOCOMOTIVES

TROLLEY LOV

-2% T. Jeffrey, 35° ga.

-4% T. Goodman, 35° ga.

-5 T. Jeffrey, 36° ga.

-6 T. Goodman, 36° ga.

-6 T. Goodman, 42° ga.

-13 T. Jeffrey, 42° ga.

-13 T. Jeffrey, 42° ga.

3-15 T. Jeffrey, 42° ga.

3—15 T. Jeffrey, 42° ga.

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1—8.2 KW G. E. 150/182 V.. 15 HP motor, 440V, AC

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4—250V D.C. battery charger, model U. 248-200E 126.5 volta

23 HP motor, 440 volta AC

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Since 1898 Dependable Reconditioned Machinery

#### MORSE BROS., MACHINERY CO.

2900 BRIGHTON BLVD.

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DENVER 1, COLO.

#### FOR SALE CAT TRUCKS 220 volts, AC. 250 volts, DC.

truck, 220 volts, A lat trucks, 250 volt CONVEYORS

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1—12" Jeffrey drag conveye 29" long.
1—36" McNally Pittaburgh Belt conveyer 38" long.
1—Barber-Greene Car Unloader.
1—10" Drag Conveyer 57:9" long.
1—10" Drag Conveyer 33½" long.
1—14" Drag Conveyer 33½" long.
1—30" Drag Conveyer 28" long.

Several tons 1,000,000 CM bare copper, 200'-1000'.

Several tons 5,00,000 CM bare copper, 500'-1000'.

Approximately 15,000' 3/conductor, 2/0 5000 volt.

300'-500' long as good as new, wrapped on reels.

Several 1000 ft. reels of 3/conductor, 2/0 armored.

Isod covered 2300 volt cable.

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lead covered 2309 voit cable.

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3-36 x 36 Jeffrey single roll crushers, any size coal.

2-18 x 16 McNally Pittsburgh double roll stoker.

1-25 x 24 McNally Pittsburgh single roll crusher.

1-25 x 24 McNally Pittsburgh single roll crusher, and a McNally Pittsburgh single roll crusher.

1-25 x 10 McNally Pittsburgh single roll crusher, and an account of the company of the compan

1—30" SH-30 Jeffrey Aerodyne fan, with motor.

1—4" Jeffrey booster fan, ball bearing, new type, without motor. We can furnish any size motor to run the fator. We can furnish any size motor to run the fator. We have the fator of the fator

1-7' Joy Fan.

3-11 BU Joy Loaders, type 10APE.
Permissible.

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3-15 ton MH77 Jeffrey ball bearing armature locomotives, complete with hydraulic brakes. New in 1947, used 2 years, as good as new. Complete specifications as follows:

42" gauge, overall dimensions, length 16'8", width 5'4's, wheelbase 6'4", height 42". Heavy luty equipment making locomotive weigh ap
17 ton.

18 years ball hearing armature loco
19 years armature loco
10 years ball hearing armature loco
11 years ball hearing armature loco
12 years armature loco
13 years ball hearing armature loco
14 years ball hearing armature loco
15 years ball hearing armature loco
16 years ball hearing armature loco
17 years ball hearing armature loco
18 years ball hearing armature loco-

luty equipment making nonmart-prox, 17 ton.

3-15 ton MH77 Jeffrey ball bearing armature loco-motives, 42" gauge, not with hydraulic brakes, late type, as good as new Dimensions, length 16"8" width 5"4", wheelbase 6"4" height 42". Heavy duty equipment making locomotive weight late type, as good as new Dimensions, length 16'8", width 5'4'5" wheelbase 6'4", height 42'.

Heavy duty equipment making lecomote weigh approx, 17 ton.
1-10 tea Mili43 Jeffrey locomotive, complete with ball bearing journals and armatures, 2"5575, 42" gauge. Overall height 34", length 14'2", width 61", wheelbase 64". This locomotive was used

very little. Just like new, and we have an extraset of new armature field coils and new parts
worth several hundred dollars.
2—10 ton General Electric, ball bearing, 48" gauge,
48" gauge,
18—6 ton MHBS Jeffrey, ball bearing, 42" gauge,
18—6 ton MHBS Jeffrey, ball bearing, 42" gauge,
18—6 ton Goodman, 42" gauge, late type, 30" high.
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1—512 EJH Goodman, 259 volts, DC, permissible,
8½" cutter bars with hydraulic Jacks and bug
dusters, complete with Joo TI Cut truck.
1—22 UK Jeffrey Mining Machine, 259 volts, DC,
1—512 UK Bar, man 250 volts, DC, permissible, 8½"
cutter bar, complete with Goodman bug duster,
and Goodman MAT Cut truck.
6—7B-1 Sullivan, 250 volts, DC, 8½" cutter bars,
complete with bug dusters, permissible, with Joy
TI Cat trucks.

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compete with bug dusters, permissble, with Joy Tl Cat trucks.

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1—300 KW Ridgeway Motor Generator eet, 2200 volts. AC end, 275 volts DC end complete with sultcibboard as good as new.

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2—300 KW General Electric motor generator sets, 200 RPM, 2300 volts AC end, 250/275 volts DC end.

3—150 KW General Electric motor generator sets 1200 RPM, 2300 volts AC end, 250/275 volts DC end.

Above sets all complete with either fully automatic switchboards or manual starters and automatic circuit breakers.

ROCK DUSTERS

matic circuit breakers.

ROCK DUSTERS

3-M8A Type 8 rock dusters, 20 HP, DC motors, 230 volts, 42" gauge track.

--M8A Bantam Bock Duster, 90 volts, DC.

3—M8A Type 8 rock output
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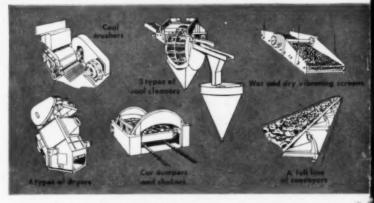
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